ARRCOM DMWR 9-1315-C282-F1

DEPOT MAINTENANCE WORK REQUIREMENTS
FOR
RENOVATION OF
CARTRIDGE 90mm: M371

*Including CHANGE 2

THIS PUBLICATION IS NOT AVAILABLE THROUGH AG PUBLICATIONS CHANNELS

HEADQUARTERS, US ARMY ARMAMENT MATERIEL READINESS COMMAND

NOV 1972

DMWR 9-1315-C282-F1
C2

Change)
)
)
No. 2)

HEADQUARTERS
U.S. ARMY ARMAMENT MATERIEL
READINESS COMMAND
Rock Island, Illinois, January 1980

DEPOT MAINTENANCE WORK REQUIREMENTS FOR RENOVATION OF CARTRIDGE 90MM HEAT AND PRACTICE, M371

DMWR 9-1315-C282-F1, November 1972, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page.

Remove pages	Insert pages
A	A
2-3 thru 2-8	2-3 thru 2-8
2-11 and 2-12	2-11 and 2-12
None	Authentication Page, C2
None	Dist. 1 thru Dist. 8

2. File this change sheet in front of the publication for reference purposes.

Change)
No. 1 /)

HEADQUARTERS

U.S. Army Munitions Command
Joliet, Illinois, 26 January 1973

DEPOT MAINTENANCE WORK REQUIREMENTS

FOR

RENOVATION OF CARTRIDGE 90 MM

HEAT AND PRACTICE, M371

DMWR 9-1315-C282-F1, November 1972, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page.

Remove pages	Insert pages
A	A
2-3, 2-4	2-3, 2-4
2-13, 2-14	2-13, 2-14

File this sheet in front of the publication for reference purposes.

FOR THE COMMANDER:

Ritchie Buckingham

RITCHIE BUCKINGHAM
Act Chief, Maint Division
Mat Mgt and Maint Directorate

DISTRIBUTION:
SPECIAL

LIST OF EFFECTIVE PAGES

Total number of pages in this manual is 93 consisting of the following:

PAGE NO.	*CHANGE NO.
Cover	0
A	2
i and ii	0
1-1 and 1-2	0
2-1 and 2-2	0
2-3 — 2-8	2
2-9 and 2-10	0
2-11 and 2-12	2
2-13	1
2-14 — 2-21	0
2-22 Blank	0
3-1 — 3-5	0
3-6 Blank	0
4-1	0
4-2 Blank	0
A-1 — A-4	0
B-1 — B-3	0
B-4 Blank	0
C-1 — C-23	0
C-24 Blank	0
D-1 — D-7	0
D-8 Blank	0
Authentication page, C2	2
Dist. 1 — Dist. 8	2

*Zero in this column indicates an original page.

TABLE OF CONTENTS

CHAPTER 1 - INTRODUCTION

SECTION I - GENERAL

1-1-1. General.

a. The technical data contained herein is provided for use in preparing local Standing Operating Procedures in accordance with paragraph 2 of Appendix C.

b. In those instances where approved procedures are on hand for similar items which are adaptable to the item described herein, and where their application will require no major modification or additional operations, a new SOP will not be required provided all safety precautions therein are approved by the Commanding Officer.

c. If, to accomplish a task, a Commanding Officer believes an exemption to mandatory requirement of regulations is essential, such need for exemption will be pointed out and fully justified. Operations involving such unauthorized deviations will not be started prior to receipt of exemption.

1-1-2. Work Planning.

a. Operations should be planned to eliminate accumulation of excess explosive items. The quantity of explosive or ammunition items at an operating location must be the minimum necessary to carry out an efficient operation.

b. The explosive supplies or components required for the operation should not exceed a four-hour work requirement. Supplies exceeding a four-hour supply should be kept in a service storage building.

c. Planning should include removal of the line rejects or explosive waste to prevent accumulation of excess explosive items in the operating building. The quantity of reject explosive or ammunition items should be the minimum necessary to carry out an economical operation. Unsafe or hazardous items should be packed and transferred to destruction site for disposal.

1-1-3. Disposition.

a. Disposition instructions for components and packing materials will be furnished CONUS activities at such time as maintenance, renovation, or demilitarization project is authorized.

b. Oversea activities will request disposition instructions from O/S Theater Central Inventory Control Branch prior to start of operations.

c. All residual metal components and all packing material after demilitarization will be inspected and certified for adequacy of decontamination in accordance with paragraphs 13 and 29 of Appendix C.

1-1-4. Equipment.

Locally designed equipment for disassembly of explosive loaded components must have approval from AMC Ammunition Center, Savanna, Illinois 61074, prior to commencing operations.

1-1-5. Suggestions.

Any suggestions or recommendations to the procedures or technical criteria provided in this DMWR will be submitted to US Army Munitions Command, Office of the Deputy Commanding General, ATTN: AMSMU-MM-MDA, Joliet, Illinois 60436, for review.

CHAPTER 2 - WORK INSTRUCTIONS

SECTION I - OPERATION NO. 1, REMOVE ROUNDS FROM STORAGE, TRANSFER TO OPERATING LINE AND UNPACK

2-1-1. Description of Operation.

a. Identify the item, remove from storage, load on carrier and transfer to Operating Line.

b. Unload from carrier and transfer to temporary storage bay and/or unpacking operation.

c. Unpack round and inspect for deteriorated or any unusual condition that would render item unsafe to process in a normal manner.

NOTE: Any round found unsafe to process in a normal manner should be packed, identified and transferred to Operation No. 12 for disposal.

Protect primer with suitable cap or protector during transfer operations. Reference paragraph 20 of Appendix C.

If components are to be retained, ammunition lot integrity must be maintained at all times in this and ensuing operations.

d. Transfer repairable complete rounds to Operation No. 2. Identify and transfer unserviceable irrepairable projectiles to Operation No. 12.

e. Transfer serviceable repairable packing material to Operation No. 10.

f. Transfer unserviceable irrepairable packing material to Operation No. 12.

2-1-2. Inspection and Safety Requirements (Special).

a. Operator engaged in cutting or handling steel strapping or wire must wear leather-palmed gloves, face shield or safety goggles and steel-toed shoes.

b. Unserviceable packing material is to be inspected in accordance with provisions of paragraph 13 of Appendix C.

c. Ammunition handling to be in accordance with paragraph 4 of Appendix C.

d. Use extreme care in handling at all times as the projectile in this cartridge is initiated by the electric impulse of the piezoelectric element located in the nose.

2-1-3. Disposition of Components and Material.

a. Complete round to Operation No. 2.

b. Serviceable packing material to Operation No. 10.

c. Deteriorated-unserviceable irrepairable rounds to Operation No. 12.

d. Unserviceable irrepairable packing material to Operation No. 12.

2-1-4. Equipment Requirements.

a. Approved transfer equipment and hand tools.

b. Machine, Lid Remover, Automatic APE 1270-0000 with Accessory Kit or Lid Removal Machine, Pneumatic APE 1003, FSN 4925-926-3635.

c. Leather-palmed gloves, face shields or safety glasses and steel-toed shoes.

CHAPTER 2 - WORK INSTRUCTIONS

SECTION II - OPERATION NO. 2, REMOVAL OF CARTRIDGE CASE

2-2-1. Description of Operation.

a. Receive complete rounds from Operation No. 1, and Operation No. 7.

NOTE: Protect primer with suitable cap or protector during handling and transfer operation. Reference paragraph 20 of Appendix C.

b. Place cartridge in pull apart machine. Secure round, close door and actuate air valve to separate cartridge case from projectile.

c. Pull apart operation will be conducted only when the machine is installed with an operational shield or behind an approved barricade in accordance with paragraph 9 of Appendix C.

d. Remove cartridge case and projectile from pull apart machine. Use care when removing cartridge case from projectile and fin boom so as not to rub against propellant bag.

e. Inspect for propellant contamination in cartridge case or torn propellant bag. Any contamination or loose grains should be collected and taken to Operation No. 5 for deposit with propellant being generated at this point for subsequent disposal.

NOTE: Protect fin assembly during handling of projectile with fin boom.

f. Collect broken pieces of rupture disc and place in a container for transfer to Operation No. 12 for disposal.

2-2-2. Inspection and Safety Requirements (Special).

a. Conductive floors shall be provided at operation locations in accordance with provisions of paragraph 6 of Appendix C. All personnel shall be provided with conductive steel-toed shoes and flameproof coveralls. All equipment shall be properly cross-bonded and electrically grounded.

b. Pull apart machine must be shielded and provided with a deluge system.

c. Inspect components of rounds from Bullet-Pull Test for serviceability.

2-2-3. Disposition of Components and Material.

a. Projectiles to Operation No. 3.

b. Cartridge cases to Operation No. 7.

c. Serviceable components from Bullet Test to Operation No. 7.

d. Unserviceable components from Bullet Test to Operation No. 12.

2-2-4. Equipment Requirements.

a. Approved transfer equipment and hand tools.

b. Vertical Pull Apart Machine APE 1001, FSN 4925-782-6087 with applicable accessories Kit E075.

c. Goggles or eye shields, conductive steel-toed shoes and flame retardant coveralls.

d. Conductive floors or matting.

CHAPTER 2 - WORK INSTRUCTIONS

SECTION III - OPERATION NO. 3, REMOVAL OF PRIMER AND IGNITER

2-3-1. Description of Operation.

a. Receive round from Operation No. 2 and place in holding fixture of primer removal machine.

b. Activate primer removal machine and remove primer.

c. After removal place primer into transfer box for subsequent delivery to Operation No. 12.

d. Remove igniter and place in transfer box for subsequent delivery to Operation No. 12.

e. Place round on conveyor or transfer cart for delivery to Operation No. 4.

2-3-2. Inspection and Safety Requirements (Special).

a. Extreme care will be used to prevent striking primer. Protect primer with suitable cap or protector during handling and transfer operation.

b. Care must be taken to preclude damage and/or distortion of fin assembly.

c. Primer removal machine must be shielded.

d. Flame retardant coveralls, safety glasses and conductive steel-toed shoes.

2-3-3. Disposition of Components and Material.

a. Primers and igniters to Operation No. 12.

b. Projectile with fin boom to Operation No. 4.

2-3-4. Equipment Requirements.

a. Approved hand tools and transfer equipment.

b. Fin removal wrench.

c. Machine Primer Disassembly APE 1153 and Accessory Kit APE 1153-E002 (4925-926-0902 and 4925-1153-E002).

CHAPTER 2 - WORK INSTRUCTIONS

SECTION IV - OPERATION NO. 4, REMOVAL OF FIN

2-4-1. Description of Operation.

a. Receive round from Operation No. 3 and place in Fin Boom Removal Machine.

b. Using care to avoid pinching the propelling charge assembly, remove the fin boom from the adapter by using a wrench.

c. Place fin boom in conveyor or transfer cart for delivery to Operation No. 5.

d. Place projectile on conveyor or transfer cart for delivery to Operation No. 6.

2-4-2. Inspection and Safety Requirements (Special).

a. Assure that propelling charge bags have not been damaged which could permit spillage of propellant.

b. Disassembly equipment must comply with paragraph 9 and 10 of Appendix C.

c. Flame Retardant Coveralls, Safety Glasses and Conductive Steel-Toed Shoes.

2-4-3. Disposition of Components and Material.

a. Fin and boom with propelling charge to Operation No. 5.

b. Projectiles to Operation No. 6.

2-4-4. Equipment Requirements.

a. Machine Vertical Disassembly APE 1227 (No FSN assigned).

b. Approved hand tools and transfer equipment

CHAPTER 2 - WORK INSTRUCTIONS

SECTION V - OPERATION NO. 5, REMOVAL OF PROPELLING CHARGE

2-5-1. Description of Operation.

a. Receive fin boom with propelling charge from Operation No. 4.

b. Remove propellant charge by hand and place propellant in container for subsequent transfer to Operation No. 12.

NOTE: There should be no more than 2 operators in bay that propellant is being collected. Also, the amount of propellant should not exceed 150 pounds including propellant in containers and on fin booms.

Propellant may be disposed of by burning in bag as generated, or may be packaged and retained to support demolition ground activities.

c. Place fin boom on conveyor or transfer cart for delivery to Operation No. 6.

2-5-2. Inspection and Safety Requirements (Special).

a. Operators must wear conductive steel-toed shoes, flame retardant coveralls, and face shield or safety glasses.

b. Propellant collection containers, floors and table tops must be grounded.

c. Operation must be provided with deluge system.

2-5-3. Disposition of Components and Materials.

a. Fin boom to Operation No. 6.

b. Unserviceable propellant to Operation No. 12 or storage location if retention is desired.

2-5-4. Equipment Requirements.

a. Approved hand tools and transfer equipment.

b. Propellant charge container.

c. Safety glasses, face shields, conductive sole safety shoes and flame retardant coveralls.

CHAPTER 2 - WORK INSTRUCTIONS

SECTION VI - OPERATION NO. 6, ASSEMBLY OF PROPELLING CHARGE M82 TO FIN BOOM AND FIN BOOM TO PROJECTILE

2-6-1. Description of Operation.

a. Receive fin boom from Operation No. 5.

b. Assemble new propelling charge on to fin boom by hand and tie securely to fin boom.

c. Place projectile in holding fixture.

d. Coat threads of fin boom with silicone compound, MIL-C-21567.

e. Using care to avoid pinching the propelling charge, assemble the fin boom to the adapter using a wrench and assemble with 325 inch pounds minimum torque.

f. Transfer assembled projectiles to Operation No. 7.

2-6-2. Inspection and Safety Requirements (Special).

a. Operators must wear conductive soled shoes, flame-retardant coveralls, and face shields or safety glasses. Containers, floors and table tops should be grounded.

b. Operation should be provided with a deluge system.

2-6-3. Disposition of Components and Material.

Projectile to Operation No. 7.

2-6-4. Equipment Requirements.

a. Approved transfer equipment and hand tools.

b. Safety glasses/face shields, conductive soled safety shoes and flame-retardant coveralls.

c. Torque wrench.

d. Vice APE 1065 with Accessory Kit 1065-E015.

CHAPTER 2 - WORK INSTRUCTIONS

SECTION VII - OPERATION NO. 7, ASSEMBLY OF CARTRIDGE CASE

2-7-1. Description of Operation.

a. Receive projectile from Operation No. 6 and Operation No. 2.

b. Coat exterior surface of projectile at Zone A (Drawing 8863468) with rubber cement, Type II, Spec MIL-A-5092.

c. Place round in jaws of crimping machine.

d. Receive cartridge case from Operation No. 2.

e. Insert rupture disc in base of cartridge case.

f. Assemble cartridge case to projectile while adhesive is wet. Remove visible excess adhesive after assembly.

g. Crimp cartridge case to projectile to meet 2750 $\pm$ 750 pounds bullet pull requirement. Advisory 16-0.125 ball crimps equally spaced.

h. Perform bullet-pull test. Projectile to separate at a load between 2000 and 3500 foot pounds.

i. Rounds pulled apart in process control of crimping machine performance and acceptance inspection are to have the component parts inspected for serviceability. Components which are considered serviceable are to be forwarded to their corresponding operations for reprocessing. Unserviceable items are to be disposed of as line rejects. Quantity of samples will be determined locally and should be governed by an absolute minimum quantity that will insure that the crimping machine is producing acceptable pull values.

j. Place assembled round on conveyor or transfer cart for delivery to Operation No. 8, or Operation No. 2.

2-7-2. Inspection and Safety Requirements (Special).

a. Inspect to assure that excess adhesive is not visible.

b. Operators must wear face shield or safety glasses, flame retardant coveralls, and steel-toed safety shoes. Reference paragraph 5 of Appendix C.

2-7-3. Disposition of Components and Material.

a. Transfer round to Operation No. 8.

b. Transfer rounds for bullet pull test to Operation No. 2.

2-7-4. Equipment Requirements.

a. Approved transfer equipment and hand tools.

b. Machine Crimper APE 1010 with Accessory Kit APE 1010-E004 (FSN 4925-914-2586 and 4925-464-1364).

CHAPTER 2 - WORK INSTRUCTIONS

SECTION VII - OPERATION NO. 8, ASSEMBLY OF PRIMER PERCUSSION M92

2-8-1 Description of Operation.

a. Receive round from Operation No. 7.

b. Using Lacquer, Spec. MIL-L-10287, seal around the outer flange and primer flange.

c. Coat primer threads with silicone compound, Spec MIL-C-21567 and assemble to fin applying 50 ± inch pounds assembly torque.

NOTE: No gap is permitted between fin and rupture disc.

d. Inspect for high primer using straight edge gage.

e. Place round on conveyor or transfer cart for delivery to Operation No. 9.

2-8-2. Inspection and Safety Requirements (Special).

a. Primer parts must not protrude beyond rear of cartridge case.

b. Protect primer with a suitable cap in accordance with paragraph 20 of Appendix C.

c. All personnel shall be provided with conductive soled shoes amd flame retardant coveralls.

2-8-3. Disposition of Components and Materials.

Complete round to Operation No. 9.

2-8-4. Equipment Requirements.

a. Torque wrench.

b. Straight edge FSN 5210-239-8570 or equal.

c. Approved transfer equipment and hand tools.

d. Flame retardant coveralls, safety glasses and conductive soled safety shoes.

e. Machine Primer Remover and Inserter APE 1237 with Accessory Kit APE 1237-E003. (4925-926-7147 and 4925-1237-E003.)

CHAPTER 2 - WORK INSTRUCTIONS

SECTION IX - OPERATION NO. 9, GAGE COMPLETE ROUND

2-9-1. Description of Operation.

a. Receive round from Operation No. 8.

b. Gage complete round in profile and alignment gage. Round must freely enter gage.

c. Transfer acceptable rounds to Operation No. 11.

d. Transfer rounds that fail profile and alignment gage, which are considered irrepairable, to Operation No. 12.

2-9-2. Inspection and Safety Requirements (Special).

a. Gaging operations to comply with paragraph 19 of Appendix C.

b. Protect primer with suitable cap or protector, reference paragraph 20 of Appendix C.

c. Equipment to be grounded as required to comply with provisions of paragraph 21 of Appendix C.

d. Operators must wear steel-toed shoes.

2-9-3. Disposition of Components and Materials.

a. Transfer projectiles that pass gaging operation to Operation No. 11.

b. Transfer unserviceable irrepairable rounds to Operation No. 12.

2-9-4. Equipment Requirements.

a. Approved hand tools and transfer equipment.

b. Steel toed safety shoes.

c. Profile and Alignment Gage (Dwg 8855727) 5220-954-9921.

CHAPTER 2 - WORK INSTRUCTIONS

SECTION X - OPERATION NO. 10, INSPECT, REPAIR AND STENCIL PACKING MATERIALS

2-10-1. Description of Operation.

a. Receive packing materials from Operation No. 1.

b. Inspect and repair fiber containers. Reject unserviceable containers. Touch up bare spots on serviceable containers with acid proof black paint as required or enamel, MIL-SPEC-E-74B, Color No. 37038, Black, Federal Standard 595, FSN 8010-297-0800. It is not intended to discontinue or discourage the use of Coating Compound, Bituminous Black. Since the specification indicates that drying characteristics must be satisfactory, strict adherence to proper methods of preparation its application must be complied with. When reconditioning fiber containers, apply coating of Bituminous, Solvent Type, Black, MIL-C-450A, on scuffs, cuts or abrasions to provide moisture seal and over painting. This procedure will suffice when processing fiber containers to Condition Code A condition. However, since fiber containers with cuts, scuffs, etc., are not eligible for MAP supply, only the over painting with the enamels will apply on undamaged containers.

NOTE: 1. Two vent holes 1/4 inch in diameter will be punched 180 degrees apart into neck tube of fiber container one inch from joint of the cover and container.

2. Thinners for enamels must be those prescribed by the manufacturer.

c. Repair and restencil fiber containers as prescribed by Dwg. No. 8796521.

d. Repair and remark packing boxes as prescribed by Dwg. No. 8796522.

NOTE: Loaded date (month and year) will be the current date round is renovated rather than the original loaded date; indicate in "Remark Block" on Ammunition Data Card.

e. Transfer serviceable packing materials to Operation No. 15.

f. Transfer unserviceable/irrepairable packing materials to scrap or Operation No. 12.

2-10-2. Inspection and Safety Requirements (Special).

a. Inspect for legibility and correctness of markings.

b. Comply with paragraph 5c of Appendix C.

2-10-3. Disposition of Components and Material.

a. Transfer serviceable and repaired packing materials to Operation No. 11.

b. Transfer irrepairable packing materials to Operation No. 12.

2-10-4. Equipment Requirements.

a. Approved transfer equipment and hand tools.

b. Paint and solvent containers of approved type. Comply with paragraph 25 of Appendix C.

c. Stencil or marking equipment.

d. Cotton cloths.

e. Paint spray booth, FSN 4925-926-3676, or approved type.

f. Fiber container hole punching machine, FSN 4925-756-2735 or 4925-935-4651.

g. Paint brushes.

h. Flame retardant coveralls, safety glasses, and steel-toed shoes.

CHAPTER 2 - WORK INSTRUCTIONS

SECTION XI - OPERATION NO. 11, REPACK ROUNDS

2-11-1. Description of Operation.

a. Receive rounds from Operation No. 9.

b. Receive fiber containers and boxes from Operation No. 10.

NOTE: Minor obliteration and remarking may be performed on rounds, containers and boxes using obliterating paint, small brushes and rubber stamp type stencils and stencil ink.

c. Place round in fiber container, nose end first, using sufficient filler to insure a tight pack.

d. Place round (in fiber container) in taping machine and apply a band of one and one-fourth wraps around container. Cut tape to provide a pull tab.

e. Remove round from taping machine and stencil container as required.

f. Place two containers in packing box with the sealing strips of containers at opposite end of box.

g. Close lid on box, seal, and band box.

h. Place boxes on pallet and/or skids in accordance with applicable drawings. Strap boxes to pallet or skid.

NOTE: Fiber containers and wooden boxes to be marked in accordance with Drawings 8796521 and 8796522.

2-11-2. Inspection and Safety Requirements (Special).

a. Operators engaged in cutting or handling strapping or wire must wear leather-palmed gloves and face shields or safety goggles.

b. Fork lifts to be protected with overhead guards.

c. Visually inspect rounds 100 percent prior to packing in fiber container to assure complete assembly.

2-11-3. Disposition of Components and Material.

Packed ammunition to storage

2-11-4. Equipment Requirements.

a. Approved transfer equipment and hand tools.

b. Strapping machine, electric powered, APE 2065 or 1030, FSN 4925-926-3636.

c. Leather-palmed gloves, face shield or safety glasses and steel-toed shoes.

d. Taping machine, powered, FSN 4925-756-2736, APE 1209.

e. Stencil and marking equipment.

f. Paint and solvent containers of approved type.

CHAPTER 2 - WORK INSTRUCTIONS

SECTION XII - OPERATION NO. 12, DESTROY LINE REJECTS, UNSERVICEABLE COMPONENTS AND PACKING MATERIAL

2-12-1. Description of Operation.

a. Receive deteriorated or unserviceable rounds, components and packing material from all preceeding operations.

b. Destroy deteriorated or unserviceable rounds in accordance with the provisions of paragraphs 5 or 6 of Appendix D.

c. Destroy primers and igniters by burning in an adequate destruction furnace or on a bed of combustible material in accordance with the provisions of paragraphs 2, 3 or 4 of Appendix D.

d. Destroy propellant by burning in accordance with the provisions of paragraph 8 of Appendix D.

e. Dispose of all unserviceable irreparable packing material by burning in accordance with applicable provisions of Appendix D.

2-12-2. Inspection and Safety Requirements (Special).

a. All scrap recovered from the above activities must be inspected for adequacy of decontamination in accordance with provisions of paragraph 13 of Appendix C.

b. All burning and demolition operations are to comply with the applicable provisions of Appendix C.

c. Operators shall wear flame retardant coveralls, safety glasses or face shield and steel-toed shoes in accordance with paragraph 5 of Appendix C.

2-12-3. Disposition of Components and Material.

Scrap metals to Scrap Yard.

2-12-4. Equipment Requirements.

a. Approved transfer equipment and hand tools.

b. Furnace Ammunition Deactivation, Heavy Duty, APE 1236 (FSN 4925-477-6262).

c. Flame retardant coveralls, safety glasses or face shield and steel-toed shoes.

CHAPTER 3 - ACCEPTANCE REQUIREMENTS

SECTION I - GENERAL

3-1-1. SB 742-1 Section VI will be used for required inspection plan, sample size and acceptance quality level.

3-1-2. Lot formation will be as outlined in MIL-C-46927 (MU) for Practice and MIL-C-46467-C-(MU) for HEAT, M371.

3-1-3. See Appendix A for a list of drawings and specifications required to perform inspection.

3-1-4. Ballistic samples will be selected and tested as required by applicable paragraph of the item specification. A ballistic test request (BTR) will be initiated by APSA when the installation advises date and number of lots to be produced.

3-1-5. Bullet pull will be performed as stated in paragraph 4.2.3 of applicable item specification.

3-1-6. Profile and alignment gaging will be performed as stated in paragraph 4.2.3 of applicable item specification.

3-1-7. Workmanship will be performed as specified in the applicable paragraph of the item specification.

3-1-8. The inspection equipment required to perform the examination and tests prescribed by this procedure are to be found in IEL 8865243 for the practice item and 8863468 for the HEAT item.

3-1-9. Samples will be selected at random or whenever possible at points along operation line which will not require disassembly or unpack to perform inspection.

3-1-10. Lot numbers will be assigned as outlined in paragraph 5.1.2, MIL-STD-1168. Data cards will be prepared as required by MIL-STD-1167B.

SECTION II - CLASSIFICATION OF DEFECTS AND DEFECT STANDARDS

3-2-1. Only those defects incidental to the operation being performed will be considered. Acceptable Quality Level (AQL) for defects in the class will be as established in Section VI of SB 742-1.

The following defect classifications are established:

3-2-1-1. Adapter, prior to assembling to loading assembly (see Dwg 8863469 covering a detail of Dwg 8863468).

Categories	Defects	Method of Inspection
Critical:	Threads obviously malformed	Visual
Major:	None defined	
Minor:	Silicone compound missing from adapter threads	Visual

3-2-1-2. Loading assembly prior to assembling fin (see Dwg 8863469 and 8865242 covering a detail of Dwg 8863468 and 8865243).

Critical:	Gap at adapter to body joint (see paragraph 6.11 of item specification) (HEAT M371 only) (None defined for Practice M371)	Gage
Major:	Adapter fails to withstand subsequent reapplication of min assy torque.	Test
	Gap between adapter and body	Visual
Minor:	None defined	

3-2-1-3. Propelling charge and fin, prior to assembling to loading assembly (see Dwg 8863468 for HEAT and Dwg 8865243 for Practice).

Critical:	Adapter thread obviously malformed (HEAT) (See paragraph 6.10 of item specification) (None defined for Practice)	Visual
Major:	Propellant leakage/Propelling Charge damaged to the extent that propellant can escape	Visual
Minor:	Propelling charge damaged or stitches missing but not to extent that propellant can escape	Visual
	One or more propelling charge bag stitches broken or skipped	Visual
	Propelling charge bag not securely tied to fin	Visual-Manual
	Evidence of poor workmanship (see paragraph 3.7 of applicable specification)	Visual
	Silicone compound missing from fin threads	Visual

3-2-1-4. Projectile loading assembly, prior to assembly into cartridge case (see Dwg 8863468 HEAT and 8865243 for Practice).

Categories	Defects	Method of Inspection
Critical:	None defined	
Major:	360 degrees gap between fin and adapter (HEAT only)	Visual
	Fin fails to withstand subsequent reapplication of min assembly torque	Test
Minor:	Protective coating with bare spot	Visual
	Marking misleading or unidentifiable	Visual
	Evidence of poor workmanship (see paragraph 3.7 of applicable specification)	Visual

3-2-1-5. Rupture disc (see Dwg 8848566 covering a detail of Dwg 8863468).

Critical:	None defined	
Major:	None defined	
Minor:	Thickness	Gage
	Outside diameter	Gage
	Inside diameter	Gage
	Evidence of poor workmanship (see paragraph 3.7 of specification)	Visual

3-2-1-6. Cartridge case, prior to assembly of projectile (see Dwgs 8863468 HEAT and Dwg 8865243 Practice).

Critical:	None defined	
Major:	Adhesive missing from mouth of cartridge case	Visual
Minor:	None defined	

3-2-1-7. Cartridge assembly (see Dwg 8863468 HEAT and Dwg 8865243 Practice).

Critical:	Primer protruding beyond rear of cartridge case	Gage
Major:	Primer fails to withstand subsequent reapplication of min assembly torque	Test
	Cartridge case crimp missing	Visual
	Nose cap fails to withstand subsequent reapplication of min assembly torque	Test
	Lacquer missing from primer flange and edge of rupture disc (HEAT)	Visual

Categories	Defects	Method of Inspection
Minor:	Protective coating with bare spot	Visual
	Lacquer missing from primer flange and edge of rupture disc (Practice)	Visual
	Marking misleading or unidentifiable	Visual
	Evidence of poor workmanship (see paragraph 3.7 of applicable specification)	Visual
	Silicone compound missing from spike threads (prior to assembly of nose cap)	Visual
	Silicone compound missing from primer threads (prior to assembly to fin)	Visual
3-2-1-8.	Unsealed fiber container (see Dwg 8796717).	
Critical:	None defined	
Major:	Cartridge support missing	Visual
Minor:	Cartridge improperly assembled in container	Visual
	Glue or asphalt on round	Visual
	Round cannot be removed by hand	Manual
	Container cap cannot be removed by hand	Manual
	Evidence of poor workmanship (see paragraph 3.7 of applicable specification)	Visual
3-2-1-9.	Sealed fiber container (see Dwg 8796717).	
Critical:	None defined	
Major:	Container damaged or cut through all asphalt layers	Visual
	Tape incomplete or badly wrinkled	Visual
	Metal end loose or distorted	Visual-Manual
Minor:	Marking misleading or unidentifiable	Visual
	Gap between cover and body of container exceeding 1/8 inch	Visual
	Tear tab length inadequate	Manual
	Cuts, scuffs or gouges in outer layer	Visual
	Contents loose	Manual
	Evidence of poor workmanship (see paragraph 3.7 of applicable specification)	Visual

3-2-1-10. Sealed packing box (see Dwg 8796716).

Categories	Defects	Method of Inspection
Critical:	None defined	
Major:	Box damaged exposing contents	Visual
	Hardware or strapping missing, broken or loose	Visual-Manual
	DOD symbol missing or incorrect	Visual
	Board broken	Visual
Minor:	Car seal missing, unsealed or improperly positioned	Visual
	Marking misleading or unidentifiable	Visual
	Hardware or strapping improperly engaged or mislocated	Visual-Manual
	Handle missing or insecure	Visual-Manual
	Evidence of poor workmanship (see paragraph 3.7 of applicable specification)	Visual

CHAPTER 4 - REPORTING REQUIREMENTS

SECTION I - GENERAL

4-1-1. Work Accomplishments.

Work accomplishments will be reported in accordance with AR 700-22 "World-Wide Ammunition Reporting System WARS."

4-1-2. Line Rejects.

Line rejects will be reported in accordance with TM 38-750 "The Army Maintenance Management System (TAMMS)."

SECTION II - REPORTS

4-2-1. Blank Forms.

a. DA Form 2415 will be utilized by depots for reporting a material which the depot may recommend for disposal.

b. AMC Form 1397R will be utilized by the NMP as the authorization and by the depot for reporting work accomplishment and scheduling.

4-2-2. Preparation of Forms.

a. DA Form 2415 (ACR) will be prepared in accordance with Chapter 5 of TM 38-750.

b. AMC Form 1397R will be prepared in accordance with Appendix II of AMCR 755-8.

APPENDIX A

PUBLICATION AND DRAWING REFERENCE LIST

1. The following publications are applicable to renovation of Cartridge, 90MM: HEAT and Practice M371 Series

PUBLICATION NUMBER	TITLE
AMCR 385-100	AMC Safety Manual
AMCR 742-1	Ammunition Surveillance and Quality Evaluation Program
TM 9-1300-203	Artillery Ammunition
TM 9-1300-206	Care, Handling, Preservation and Destruction of Ammunition
TM 9-1300-250	Ammunition Maintenance
MIL-STD-171	Finishing of Metal and Wood Surfaces
MIL-STD-1167	Ammunition Data Card
MIL-STD-1168	Ammunition Lot Numbers
MIL-STD-1235	Single and Multilevel Continuous Sampling Procedures
MIL-A-2550	General Specification for Ammunition and Special Weapons
MIL-C-21567	Specification for Silicone Compound
TT-E-516	Specification for Enamel, Lusterless
TT-I-558	Specification for Ink, Marking, non-porous Surfaces
TT-I-559	Specification for Ink, Marking Porous Surface
MIL-E-515	Enamel, Lusterless, Quick Drying
MIL-B-2427	Box, Ammunition Packing, Wood, Nailed

PUBLICATION NUMBER	TITLE
MIL-T-43036	Tape, Pressure Sensitive Adhesive Plastic Film, Filament reinforced for sealing Fiber Containers Cans
TT-L-40	Lacquer, Lusterless, Obliterating
FED-STD-595	Federal Standard Colors
MIL-STD-709A	Military Standard Ammunition Color Coding
AMCR 750-23	Ammunition Maintenance and Demilitarization Program
TT-T-291	Thinner, Volatile Mineral Spirits
TM 9-1300-250-35	Direct Support (DS), General Support (GS) and Depot Maintenance Manual for Conventional Ammunition
MIL-C-46927 (MU)	Cartridge 90MM, Practice M371, Loading, Assembling and Packing
MIL-C-46467C (MU)	Cartridge 90MM, HEAT M371, Loading, Assembling and Packing (U)
TB-ORD-657	Inspection of Propelling Charges and Bulk Propellant
TB 750-242-1	Inspection and Certification of Gages-Ammunition
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
TB 9-1300-204/1	Cartridge 90MM, HEAT and Practice M371, Description, Function and Use
DMWR 1300-0001-D1	Demilitarization of Small Explosive Loaded Items
MIL-E-74B	Enamel, Lusterless Quick-Drying
MIL-C-450A	Coating-Compound, Bituminous Solvent Type, Black for Ammunition
JAN-C-99	Cement, Pettman

2. Drawings applicable to renovation of Cartridge 90MM: HEAT and Practice M371 Series

DRAWING NUMBER	REV	DATE	TITLE
8796521	R	12/20/71	Marking and Sealing for Ammo Fiber Containers
8796522 (Sheet 1)	AB	5/19/72	Marking and Sealing for Ammo Wooden Boxes
8796522 (Sheet 2)	AD	5/19/72	Marking and Sealing for Ammo Wooden Boxes
8863469	F	1/8/71	Proj HEAT, M371A1
8863468	J	1/8/71	Ctg 90MM, HEAT, M371A1
8848808	J	3/14/66	Charge Prop M82
859546	E	6/3/68	Case, Ctg M112
8848566	D	8/5/66	Disc, Rupture
8595493	K	4/1/68	Fin
8863394	H	1/28/68	Primer Percussion M92
8847520	A	5/22/61	Primer Percussion M78
8865243	B	7/6/71	Projectile, Practice M371
8865242	B	7/6/71	Projectile, Practice M371
8796717	K	5/8/70	Container Fiber M389
8796716	H	1/8/70	Box, Packing, Wooden F/Container M389
10980600	F	6/14/67	Fuze, PI, BD, M530A1
9210935	B	3/10/66	Cup Insulation
8861654	B	3/10/66	Lucky Assembly HEAT, M371

MUCOM DMWR 9-1315-C282-F1

DRAWING NUMBER	REV	DATE	TITLE
7549083	B	2/6/62	Lucky Assembly
8796717	M	7/14/71	Container, Fiber, PA56
8796716	K	7/14/71	Box Packing Wooden f/Container PA56
8847526	C	3/13/62	Cartridge Ignition XM167

APPENDIX B

LIST OF PARTS AND MATERIALS

FSN/PART NO.	NOMENCLATURE	UNIT OF ISSUE
1315-166-0022	Disc Rupture	ea
1315-431-3444	Charge Propellant M82	ea
8595496	Case Cartridge M112	ea
1390-488-5286-N533	Primer Percussion M92	ea
8140-859-8014	Container Fiber M389	ea
8140-859-8015	Box Wood F/Cntr M389	ea
8040-290-4301	Adhesive Rubber Type II	1 qt
8040-262-9005	Spec MIL-A-5092 Adhesive Rubber Type II	1 gal
8010-161-7410	Lacquer Type II Colorless MIL-L-10287	pt
8010-515-2487	Lacquer Type II Colorless TT-L-50 (ALT)	16 oz
1315-076-1435	Cup Insulation	ea
1390-427-7733	Lucky Element	ea
6810-184-4795	Acetone	1 gal
7510-161-0811	Ink, Stencil, Black, Spec TT-I-559 (No. 37038)	1 gal
7510-161-0815	Ink, Stencil, White, Spec TT-I-559	1 gal
7510-191-6030	Ink, Stencil, Black, f/non-porous surface, Spec TT-I-558	1 gal

FSN/PART NO.	NOMENCLATURE	UNIT OF ISSUE
8010-285-4917	Paint, Stencil, Black, Spec TT-P-98	1 qt
8010-297-2122	Enamel, Black, Spec TT-E-516	1 gal
8010-297-2116	Enamel, OD, Spec TT-E-516	1 gal
8010-292-3053	Lacquer, Hot Spray, OD, Spec MIL-L-11195	1 gal
8010-527-3196 8010-161-7392	Lacquer, Lusterless (Sand Obliterating)Spec TT-L-40	1 gal 5 gal pail
8030-290-5141	Coating, Bituminous	1 gal
8135-281-4071	Strapping, Steel, 5/8" Spec QQ-S-781	1 roll
8135-290-1089	Seals for 5/8" Strapping	Box (5000)
8135-823-8071	Tape, Pressure Sensitive, Black 1" Spec MIL-T-43036	1 roll
8135-823-8073	Tape, Pressure Sensitive, Black 1½" Spec MIL-T-43036	1 roll
8135-823-8072	Tape, Pressure Sensitive, Black 2" Spec MIL-T-43036	1 roll
5340-292-0886	Seal, Lead Wire	Box (100)
8010-242-2089	Thinner, Volatile Mineral Spirits Spec TT-T-291	1 gal
8010-297-2112	Ink, Stencil, Yellow No. 33538 Spec TT-I-558	1 gal
8010-285-4936	Ink, Marking, Quick Drying Yellow No. 33538, Spec MIL-I-16557	1 gal
8010-290-4135	Paint Black No. 37038 Spec MIL-STD-171	1 gal

FSN/PART NO.	NOMENCLATURE	UNIT OF ISSUE
8010-297-0800	Paint, Spec Fed Std 595 Olive Drab (Lusterless) No. X34087, Spec of MIL-STD-171	1 gal
8030-664-4959	Compound, Silicone, Spec	1 gal
8030-569-5724	MIL-C-21567	1 lb
8010-285-4935	Paint, Stencil, Yellow, Color No. 33538 Spec TT-P-98	1 qt
5220-954-9921	Gage Profile and Alignment C/R (Dwg 8855727)	ea
5350-221-4403	Crocus Cloth	Package
5350-242-4403	Steel Wool Grade 3	1 lb roll
5350-242-4404	Steel Wool Grade 1	1 lb roll
5350-255-7736	Copper Wool Grade Fine	1 lb roll
8030-245-7032	Pettman Cement: Type A, Spec JAN-C-99	1 gal

APPENDIX C

Safety Instructions

1. General.

This appendix prescribes the general safety requirements to be utilized in preparing local standing operating procedures (SOPs) in conjunction with the local safety requirements. Detailed safety requirements are contained in TM 9-1300-206 and AMCR 385-100 which will take precedence in the event of a conflict with this appendix.

2. Standing Operating Procedures.

a. Prior to starting any operation involving ammunition, explosives or other hazardous operation, adequate standing operating procedures shall be developed and then approved by the Commanding Officer of the establishment or by a qualified member of his staff who has been delegated the responsibility for review of and authority for approval of standing operating procedure. Controlled tests may be necessary in order to establish standing operating procedure for certain operations. This standing operating procedure shall include, as a minimum, such items as safety requirements, personal protective clothing and equipment, personnel and explosives or material limits, equipment designation, and location and sequence of operations. No deviation from this procedure shall be permitted without the approval of the Commanding Officer or his designated representative.

b. All personnel involved in these operations shall become cognizant of their respective duties. Supervisors shall be responsible for this indoctrination.

c. Applicable portions of the approved standing operating procedures shall be conspicuously posted convenient to all stations involved in the operation for the guidance of all personnel. Supervisory personnel shall maintain copies of the overall standing operating procedure and be responsible for the enforcement of its provisions.

d. Action to be taken in the event of electrical storms shall be set forth in the standing operating procedure.

3. Motor Vehicles for Explosive Shipments.

a. Cargo type trucks and truck-tractor drawn semi-trailer vans are the preferred types of equipment for transporting ammunition, explosives and other hazardous material. Other types of trailers should not be used except where the material is sufficiently large to make handling by vans impractical.

b. Government owned motor vehicles used for transportation of hazardous materials shall be inspected at monthly intervals by a competent person to see that mechanical condition and safety appliances are in good working order and that oil and motor pans under engines are clean. The following requirements shall be observed during the inspection of government owned vehicles.

(1) 2 each serviceable fire extinguishers.

(2) Electric wiring in good condition and properly attached.

(3) Fuel tank and piping are secure and not leaking.

(4) Brakes, steering and other equipment are in good condition.

c. The following requirements shall be observed in the operation of Government owned vehicles transporting explosives, ammunition and other hazardous material.

(1) Set brakes during loading and unloading. In addition, when on a grade, at least one wheel must be chocked.

(2) Trucks containing ammunition or explosives should not be refueled within magazine or explosive areas.

(3) Personnel shall not be allowed to ride in or on the truck body or van of a motor vehicle transporting ammunition or explosives.

(4) Explosives, ammunition or other hazardous materials shall not be loaded into or unloaded from motor vehicles while the motors are running.

4. Ammunition Handling.

a. Ammunition and explosives must be handled carefully at all times. Containers must not be tumbled, dragged, thrown, dropped, rolled, walked on the floor or struck against each other. Unfuzed bombs with shipping bands and separate loading projectiles equipped with grommets may be rolled if care is exercised. Bale hooks must not be used to handle ammunition under any condition. Palletized separate loading projectiles should not be lifted by attaching hoisting devices to the nose plugs of the projectiles. When it is necessary to lift a pallet of separate loading projectiles by the nose plugs in order to extricate them from a confined location, hoist hooks shall be attached to a minimum of four nose plugs and only to projectiles in undamaged or soundly palletized loads.

b. Metal roller conveyors, chutes and fork lift trucks may be used for handling ammunition and explosives which are properly packed. Exposed

explosives should be handled by hand or with wooden or non-sparking conveyors. Forklift trucks will not be operated in or near a magazine or building where exposed explosives or flammable explosives are present. Gasoline or diesel powered lift trucks will not be used in earth covered magazines because of inadequate ventilation.

c. Battery and gasoline powered equipment are approved for handling properly packed bulk explosives and fuzed ammunition when completely loaded and closed, provided the exterior of cartons, shells, bombs and boxes are not visibly contaminated with explosives.

5. Personal Protective Clothing and Equipment.

a. Determining Requirements.

Each operation shall be analyzed to determine the need for and specific kinds of personal protective clothing or equipment. Personal protective equipment must be properly maintained since the life of the wearer may be dependent on its proper functioning. Adequate attention to cleaning and disinfecting is especially important for equipment worn about the face. An appropriate inspection schedule should be established with the frequency of inspection dependent on the various types of equipment involved.

b. Special Clothing.

Clothing made of flame retardant treated fabrics shall be used by personnel working in buildings or operations where there is the possibility of flash fires or the possibility exists of contaminating clothing with materials that could flash. All operations shall be carefully analyzed to determine the need for flame-resistant clothing for those personnel involved.

c. Eye Protection.

Suitable eye protection devices must be worn by personnel exposed to eye injuries. The equipment (goggles or face shields) shall be clean and maintained in good serviceable condition. Goggles and eye shields must not be made of nitrocellulose or other highly flammable materials. Contact lenses cannot be considered as substitutes for appropriate eye protection.

d. Respiratory Protective Devices.

Persons employed in dusty or toxic atmospheres, where adequate ventilation or engineering controls have not been provided, shall be provided with and required to wear respiratory protective devices. The concentration of the toxic atmosphere ; contaminant shall determine the necessity for such equipment.

e. Safety Shoes.

Steel toe shoes or other approved type foot protection should be worn by all employees engaged in material handling operations designated as hazardous to feet or toes of employees. Gloves, aprons and other items of personal protective equipment shall be worn when handling materials which are sharp, abrasive, corrosive or which might splinter.

f. Conductive Shoes.

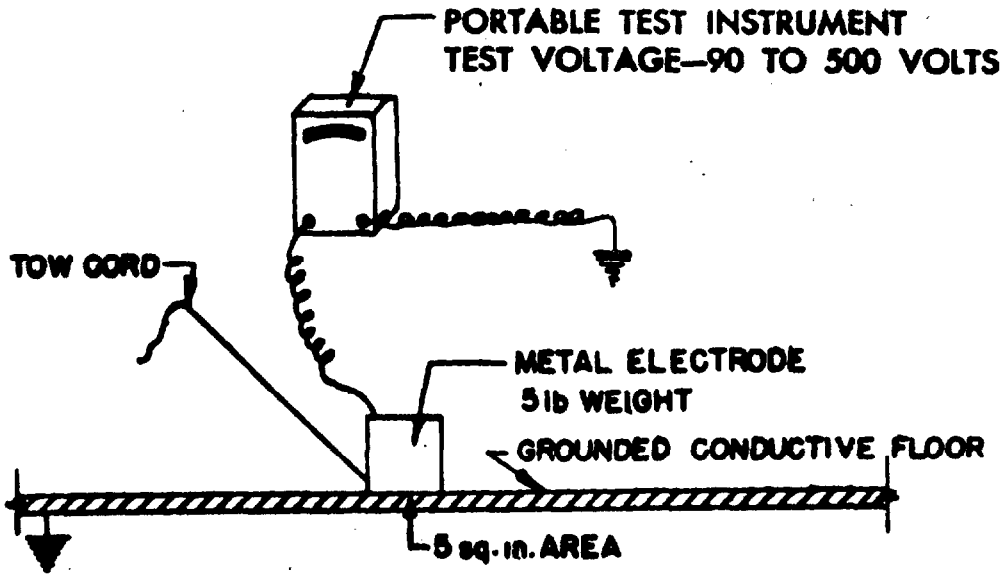
Personnel who work upon conductive flooring, conductive mats or conductive runners, where explosives or flammable vapors are present, must wear conductive shoes (See paragraph 6). Personnel from other departments or visitors who enter these areas and who walk on conductive flooring materials shall wear conductive shoes or conductive rubbers. Under no circumstances will personnel working on electrical equipment or facilities wear conductive soled safety shoes or conductive rubbers.

g. Spark Proof Safety Shoes.

The friction and shock of shoes on explosive materials and sparks from metal parts in shoes are potential hazards. For wear in the vicinity of exposed explosives not susceptible to static spark of the energy that can be discharged from a person, sparkproof (non-sparking producing) shoes are required. Shoes with soles and heels of leather, rubber or synthetic compositions (neolite, neopreme and similar composition) may be used provided the soles and heels contain no exposed nails or holes. The shoes shall have a fully enclosed safety toe cap. Periodic inspection shall be made to detect and eliminate any shoes with exposed metal. The soles and heels of shoes must be cleaned from sand and dirt before entering a building containing explosives. Conductive shoes meeting the requirements for explosives operation (non-spark-producing shoes) may be substituted for them if desired.

6. Conductive Floors.

Conductive floors and conductive shoes shall be used for grounding personnel at operations where explosives such as primer, initiator, detonator, igniter, tracer and incendiary mixtures are exposed. Some materials sensitive to static sparks are lead styphnate, lead azide, mercury fulminate, tetrazene, deazodenitrophenol, potassium chlorate, lead styphnate mixtures, igniter compositions, grade B magnesium powder, and black powder dust when exposed in layers. Dust of solid propellants can also be ignited from the spark energy that can be accumulated on a person and conductive floors and shoes must be employed when the dust is present. In addition dust air mixtures of ammonium picrate, tetryl, tetrytol, and dust of solid propellants are sensitive to static electricity discharge. When personnel



Testing Grounded Conductive Floors.

Fig 1

come into the proximity of explosives or mixtures above, conductive floors shall be installed except where the hazards of dust air or flammable vapor-air mixtures are eliminated by adequate housekeeping, dust collection, ventilation, or solvent recovery methods. Conductive floors also are required where operations are performed involving:

a. Loose unpacked ammunition with electric primers.

b. Exposed electro-explosives devices, e.g., squibs, detonators, etc.

c. Electrically initiated items with exposed electric circuity.

d. Hazardous materials that could be ignited by a static discharge from the human body. Conductive floors and footwear are not required throughout an entire building or room if the hazard remains localized. In such cases, conductive mats or runners may be used where required. Personnel, except electricians, in locations where conductive floors are required and installed shall wear conductive footwear. Conductive floors must be of nonsparking material such as lead, conductive rubber or conductive flooring composition. Non-sparking floors and work surfaces must not spark when stroked vigorously with a hardened steel file. The flooring and its grounding system must provide for electrical resistance measured between ground and a 5 pound electrode in direct contact with 5 square inches of floor area not to exceed 250,000 ohms. Where conductive floors and shoes are required, the resistance between the ground and the wearer shall not exceed 1,000,000 ohms, i.e., total resistance of conductive shoes on a person, plus the resistance of floor to ground. Where conductive floors and shoes are required, table tops upon which exposed explosives or dusts are encountered should be covered with a properly grounded conductive material meeting the same requirements as those for flooring. Initial tests shall be made of all conductive floors and subsequent tests shall be made at least semi-annually. Instruments used in making tests shall be used only when the room is free from exposed explosives. The instrument used should be portable, self-powered, enclosed unit and should consist of 2 dry electrodes. One electrode shall consist of a special metal block (5 pounds in weight) which makes contact with 5 square inches of floor area. The block should be equipped with a nonmetallic strap to enable pulling it along the surface of the floor under test. The other electrode should consist of a suitable spring test clip for attachment to a permanent ground. The electrodes shall be connected in such a manner that the resistance between electrodes may be measured as shown on figure 1.

7. Testing conductive shoes.

Tests of conductive shoes on individuals (See figure 2 and 3) for use is recommended. Locations shall be made initially and regularly thereafter to assure that the resistance from person to ground (through conductive flooring) is less than 1,000,000 ohms. When tests are so made, the maximum allowable

resistance is one million ohms. Positive safe guards must be incorporated into the design of the instruments to eliminate the chance of electric shock to the subject undergoing test. Tests must not be performed in rooms where exposed explosives are present. If resistance exceeds 450,000 ohms per shoe they shall be cleaned and retested. If readings are then sufficiently low, the shoes may be returned to service. The shoes with excessive readings shall not be used as conductive shoes.

8. Lay Out of Operations.

a. Ammunition modification, renovation and demilitarization operations should be performed in operating buildings within the ammunition work shops area. Concurrent renovation, modification, normal maintenance or demilitarization is permitted within a workshop area except as follows:

(1) The repacking of bulk black powder shall not be accomplished concurrently with operations on items having a missile producing hazard.

(2) Bulk initiating explosives shall not be processed or otherwise handled while other operations are in process.

(3) Ammunition containing blister gases or toxic chemical agents shall not be processed concurrently with other items.

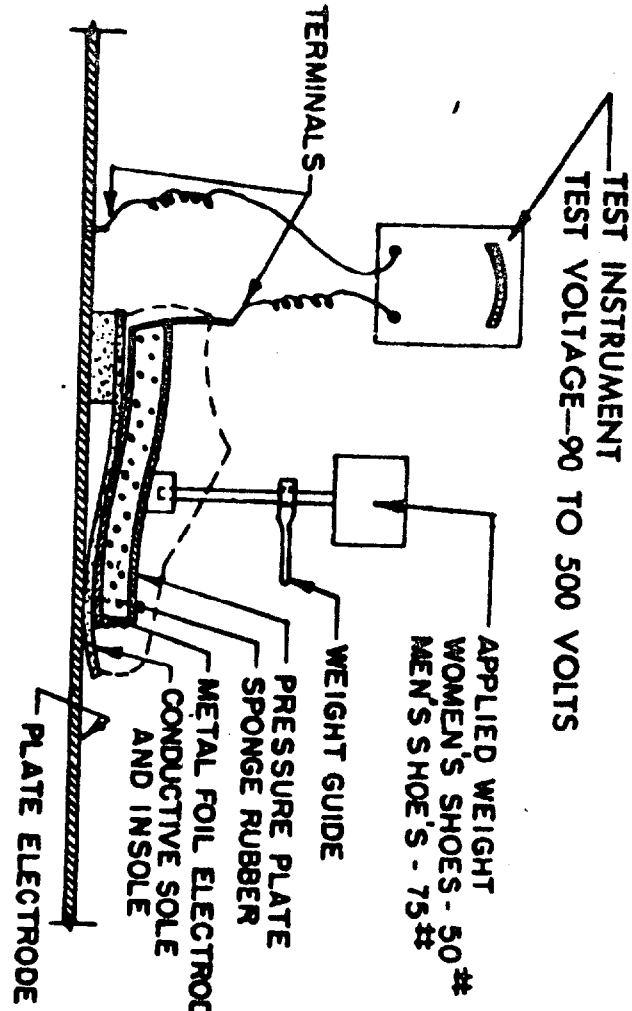
b. Permissible concurrent operations should be accomplished in separate buildings located at the appropriate intraline distance from other operating buildings in the work shop area.

c. Where the facilities described above are not available and with proper approval, normal maintenance and in some cases modification and renovation operations, may be performed in an empty magazine or in the open at intraline distance from the nearest explosives storage location, based on the maximum quantity of explosives at the operation, but in no case less than 90 feet. The performance of minor normal maintenance operations in the magazine area may be approved by the installation commander. Such operations will be limited to hand derusting and brush painting of bombs and separate loading projectiles, opening and repairing boxes and metal containers of ammunition, repacking of ammunition into serviceable boxes and fiber containers, spot painting projectiles, maintenance of fuze cavities and base covers of separate loading projectiles, and other relatively safe operations of the same general type.

d. The quantity of explosives or ammunition at an operating location shall be subdivided to the maximum extent possible into smaller amounts, adequately separated to prevent propagation of detonation. Personnel exposure shall be the minimum consistent with safe, efficient and continuous operation.

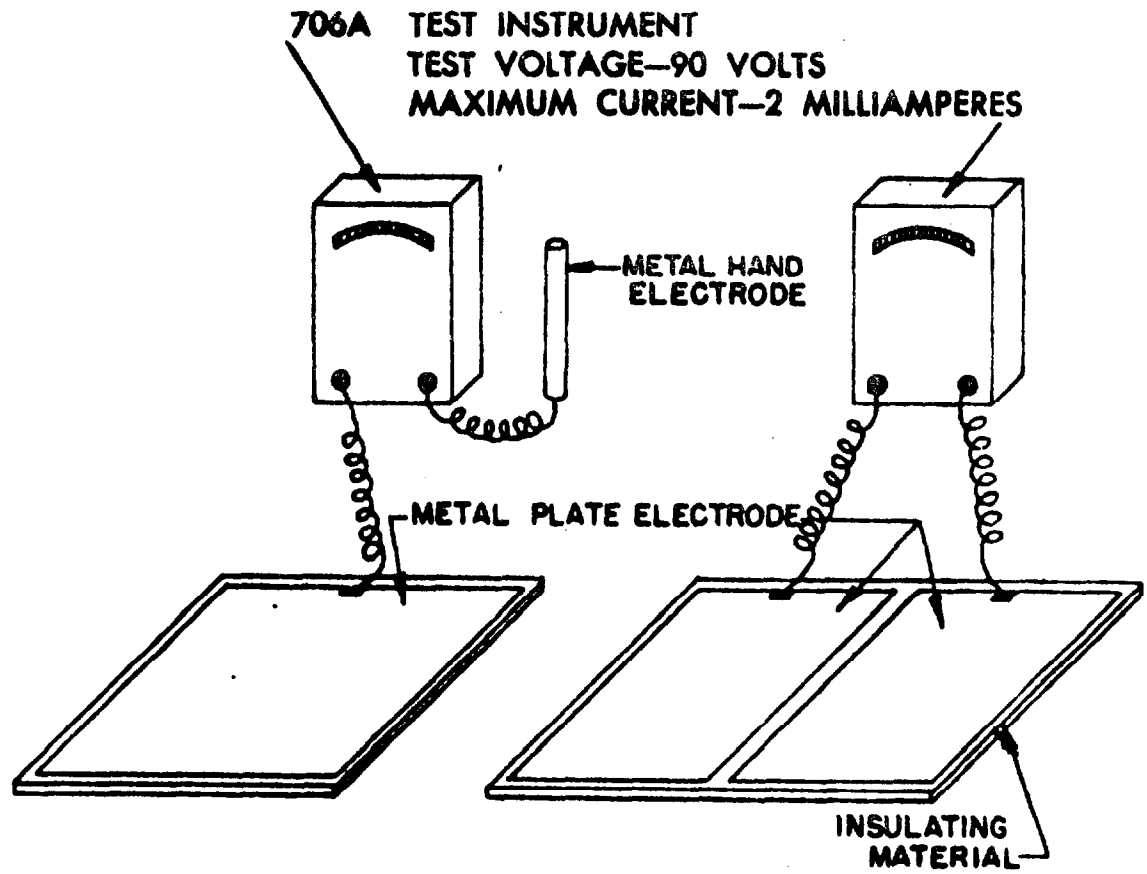
9. Requirement for Shielding Disassembly Operation.

a. Certain disassembly operations are hazardous and operational shields must be employed for the protection of employees performing such work and for those in the vicinity. The safety of disassembly operations will depend on the careful scrutiny of the work planned and the farsightedness of those responsible for safety in the establishment where operational shields are necessary.



Testing Shoes off Wearer.

Fig 2



Testing Shoes on Wearer.

Fig 3

Those provided must be securely braced and of strength proven sufficient to withstand the effects of the maximum credible incident involving the item being handled. When operational shields are equipped with access doors which function as part of the shield, the doors should be the sliding type, designed to overlap the opening and be installed on the inner face of the shield. Adequate operational shields shall be provided for operations such as:

(1) Disassembly of loaded boosters, bursters, fuzes, primers and blank ammunition.

(2) Removal of base plugs from loaded projectiles.

(3) Removal of fuzes from pentolite loaded shell.

(4) Disassembly of loaded bombs (except for removal of shipping bands, nose and tail closing plugs, fin locknut protectors, fin locknuts, and wash-out of high explosives bursting charge).

(5) Pull-apart of fixed ammunition, 20MM and larger. In the pull-apart of rounds containing self-destroying tracer, the dimensions of the shield should anticipate initiation of the propellant and the projectile.

(6) Disassembly of foreign ammunition or other ammunition items of uncertain design and condition.

b. The following and similar operations may not require operational shields for the protection of operators if the assembly has been normal and the normal equipment, tools and methods used in the assembly are sufficient to accomplish the disassembly without the application of undue force. Tools used for disassembly shall not have a greater lever advantage than those required for the assembly. For the following, care must be taken to ascertain that the assembly has been normal and that surfaces to be separated are not sealed or corroded:

(1) Removal of loaded fuzes and fuze well cups.

(2) Removal of primers from mortar ammunition.

(3) Removal of ignition cartridges from mortar ammunition.

(4) Removal of boosters or bursters from loaded projectiles.

(5) Removal of setscrew from loaded projectiles when drilling equipment is used to remove stake-punch marks and back out setscrews, positive stops must be provided to prevent the contact of the drill with the component parts of the fuze or booster which contain explosives or with the explosives in the

shell. Drills should be changed and positive stops set only by competent mechanics. Only fully trained personnel should be used for such operations, and before the operation is begun, the projectile must be examined for the presence of exudate or other abnormal conditions.

(6) Removal of fuzes from hand grenades provided:

(a) A baffled tank of sufficient size is available to dispose of a fuze that may accidentally function. When incendiary or smoke grenade fuzes are handled, the tank should contain water.

(b) Shielded trays are available to receive fuzes and not more than 50 fuzes are permitted at each disassembly station.

(c) Grenade is such that a fuze well liner is provided in the design. (NOTE: Whenever the grenade is not designed with a fuze well liner, the fuze removal must be by remote control. In addition, a mirror arrangement will be provided to observe whether the detonator body has separated from the fuze head during disassembly operations. When separation occurs, the operational shield door will not be opened before a 30-second waiting period has elapsed.)

(d) Each disassembly operation shall be separated from adjacent similar or dissimilar operations by operational shields designed to protect the operator at any operation from the blast and missiles arising from a possible explosion at any other adjacent operation. Items awaiting disassembly or resulting from disassembly operations must be placed or shielded so that propagation of an incident from the disassembly station will not occur.

(e) The operator and all other personnel must be provided complete protection from disassembly operations involving conditions that are known or expected to require use of undue force.

(f) When disassembly is required to be performed with the operator protected by an operational shield, disassembly means complete separation (threads or other connections) of component parts. In such instances, it is not permissible to loosen the components with the operator protected and then permit the operator to complete the disassembly without protection.

10. Operational Shields for Disassembly.

a. A 12-inch reinforced concrete wall provides adequate protection for disassembly operations involving an item containing 15 pounds or less of high explosives when the nearest part of the item is at least 3 feet from the wall and the item is 2 feet from the floor. A similarly constructed reinforced concrete wall that is 30 inches thick, provides adequate protection against the effects of an item containing not more than 50 pounds of

high explosives, and one that is 36 inches thick provides adequate protection for quantities of high explosives not exceeding 70 pounds. For protection of personnel from items containing more than 70 pounds of high explosives, walls specially designed to withstand the effects of detonation of the high explosives may be used, or the personnel must be in a protective shelter that is placed at intraline distance for the quantity of explosives involved. If the protective shelter is not constructed to prevent missile penetration, a barricade must be interposed between it and the ammunition from which protection is required. Operational shields for protection against items containing less than 15 pounds of high explosives may be of steel or other suitable material. The adequacy of these operational shields, including thickness, size fastening and location shall be proved by test, with a minimum safety factor of 25 percent above the maximum expected charge, before its use is permitted in regular operations. Operational shields previously tested for given quantities of explosives need not be retested for exposures of the same magnitude.

b. In existing buildings having 12-inch reinforced concrete walls, operations must be planned so that the minimum quantity of explosives or ammunition required for safe and efficient operations will be in the bays separated by the walls. This quantity must not exceed 5,000 pounds. A concrete top with interlocked reinforcing rods or other suitable cover installed over the heads of operating personnel for protection from missiles is recommended. During disassembly, ammunition items other than those with shaped charges should be placed with their longitudinal axes perpendicular to the wall, at least three feet from the wall and two feet from the floor. Greater distances should be used whenever possible. Cones of shaped charges should not be pointed toward protective shields or walls. Personnel should not be closer than two feet from the opposite side of the wall. Reassembly equipment that penetrates a protective wall must be so designed that personnel will not be injured by movement of the tool in event of a detonation.

11. Solid Propellant Collection.

a. Solid propellant being removed from the fixed rounds that are being pulled apart shall be removed from the pull-apart machine as soon as practicable. This removal is best accomplished by a properly designed vacuum-type collecting system. When vacuum systems are used, the operations and equipment shall be arranged so that the operators and pull-apart machine are not exposed to more than 15 pounds of solid propellant at any one time.

b. The common header connected to a primary collector should not serve, nor be connected to, more than three pull-apart machines. Not more than one header connected to a collector shall be operated simultaneously. Additional collecting units should be installed complete for any additional pull-apart machines, limiting each additional collecting system to not more than three machines.

c. Where vacuum collecting systems are not installed, the collection of solid propellants may be accomplished by means of a closed tube or chute leading from the pull-apart machine to a collection point located in a separate room or closure. This system is dependent on unimpeded gravity flow. Each tube or chute shall be equipped with a properly designed flash back damper to prevent exposure of personnel to flame, toxic gas and heat in event of an incident within the collection station. The tubes, troughs, and containers at the collection station shall be of nonsparking metal properly cross bonded and electrically grounded. The collection station inclosure or room should be vented directly to the outside (preferably through the roof) to prevent exposure of personnel to flame, toxic gases and heat and to prevent exposure of personnel to flame, toxic gases and heat and to prevent the rupture of the rooms or inclosures. The total poundage of solid propellants at the collection station should be limited to a minimum amount necessary to fill one container (not over 200 pounds).

12. Soldering Containers.

Containers to be soldered shall be free from explosives, explosives dust and flammable vapors. This does not prohibit soldering covers to metal liners containing completely closed ammunition.

13. Metal Scrap.

All scrap derived from renovation, normal maintenance, modification and demilitarization operations shall be inspected to detect contaminated items and shall be certified by qualified responsible personnel to be free from explosives and harmful chemicals prior to sale or reuse. Inspection shall include the opening of all closed components. Where there is the slightest doubt concerning the presence of any explosive material, the scrap shall be subjected to whatever treatment will insure that it is inert before it is sold.

14. Sand or Shot Blasting Operations.

a. Because of possible hazards resulting from hidden explosives, thin or eroded cases, and certain characteristics of explosive filler, sand or shot blasting of such items as thin cased land mines, shoulder-fired rocket ammunition, fixed rounds of artillery ammunition and cartridge storage cases containing propellant is prohibited. Blast cleaning of solid propellant rocket motors may be accomplished only with prior approval. Explosive-filled or chemical-filled ammunition items assembled with tracers, fuzes, or other explosive loaded components, which are not or cannot be adequately protected from direct contact with the abrasives, will have such components removed prior to blast cleaning. Where explosive-filled and chemical-filled items containing explosives-loaded components such as fuzes are, or can be, protected in a manner to permit blast cleaning, satisfactory safe guards must be installed to prevent rotational velocities and accelerations that

will harm or otherwise affect the component parts. In instances where items of ammunition are contained within a structurally suitable outer container, the container, if necessary, may be cleaned by sand or shot blasting.

b. Prior to sand or shot blasting any explosive-filled item, each unit must be carefully inspected for the presence of exuding explosives, chemical and/or inert seal material. If exudation can be properly removed with the application of approved solvents, the unit may then be returned for sand or shot blast cleaning. The use of alcohol for cleaning exudate is prohibited. Before blast cleaning an item containing chemical or explosives, all openings shall be closed by plugs or other suitable devices to prevent the entry and infiltration of the abrasives.

c. All metal processing equipment used at the sand or shot blasting operations shall be electrically grounded and tested.

d. All operators directly engaged in sand or shot blasting operations shall be required to wear the necessary personal protective equipment.

e. Approved type automatic or semiautomatic sand or shot blasting equipment should be installed where practicable. Remote control of equipment, from behind an adequate barrier, is preferred.

f. The quantity of loaded items being sand or shot blasted at one time should be maintained at the minimum consistent with safety and efficiency. The sand or shot blasting equipment location shall be separated from the remainder of the operations and personnel by an adequate barrier, dividing wall, or appropriate quantity distance in a manner to effectively limit the forces of an explosion during the process to the immediate area.

g. The use of steel wool should be prohibited for cleaning purposes where possible contact with exposed explosives exists; nonferrous wool should be substituted in these instances.

h. Operations involving the processing of related inert components should not be performed in close proximity to the sand or shot blasting operation involving explosives-filled items but should be accomplished at a location where safety from an explosion can be reasonably assured. Wherever practicable, the independent processing on inert components such as cleaning metal grommets and the like should be accomplished at not less than the appropriate intraline quantity-distance separation from the explosive hazard.

15. Rotational Speeds for Equipment Used in Ammunition Operations.

The following rotational speeds shall be the maximum permitted for equipment used in ammunition field operations:

a. Drilling exposed explosives - 75 revolutions per minute.

b. Cleaning metal parts seated in explosives, such as fuze seat liners in projectiles - 125 revolutions per minute.

16. Cleaning Ammunition.

Power tools with nonferrous brushes may be used on ammunition or ammunition components only when there are no exposed explosives or thin-walled casings where brushing would create heat or friction sufficient to initiate the item involved.

17. Heat Sealing Equipment.

Electric heat sealing machines should be separated from all similar or dissimilar operations by an operational shield of such proportions as to limit the effect of an incident originating at the sealing operation to the immediate vicinity. Such sealing equipment should be limited to one machine per operating room, bay or cubicle.

18. Thread Cleaning.

a. When thread cleaning is necessary, it should be accomplished by the judicious use of nonferrous "picks". Stainless steel brushes may be used to clean threads of explosive-loaded projectiles providing a fuze seat liner separates the thread cleaning operation from the explosive charge. The operator and adjacent operators need not be protected by means of operational shields; however, thread cleaning operations should be separated from unrelated operations.

b. Power actuated "thread-chasing" tools may be used to clean loaded projectiles when threads are imperfect because of previously applied Pettman cement or other sealers, provided the operation is performed within a separate cubicle and by remote control. Hand operated "thread-chasing" tools may be utilized provided no explosives are present in the threads.

c. Thread cutting or correcting cross threads shall not be performed on projectiles containing explosives. Straightening of cross threads is considered thread cutting.

19. Profile and Alignment Gaging Operations.

a. Each profile and alignment gaging operation, excluding small arms ammunition, should be so inclosed that adjacent operations are protected by operational shields. The layout of the equipment and operational procedure will be developed with a view toward minimizing personnel injury and property damage in the event of an incident.

b. During chamber gaging of major caliber fixed ammunition, the gage should be pointed toward a dividing wall or other barrier and the round inserted into the gage and removed by the same operator. In no case will the round be left in the gage.

20. Protection of Primers.

Preventive measures must be taken in the design of equipment, transportation, and operations to protect not only loose primers but also primers in rounds or in components from accidental impact or pressure. Where feasible a protecting cap should be placed over the primer. Bodies of hand trucks and other conveyances used for transporting primed items must be free from stones, protruding nails and other projections which might cause the primer to function. When primed items are transported on their bases, the containers or truck bed should be recessed at the point primers would otherwise make contact.

21. Grounding of Equipment.

The general method employed for eliminating or reducing the hazard from static is to provide electrically continuous path to ground to allow the charge to dissipate as fast as they are generated. When all the objects concerned are conductive, grounding can be readily accomplished by electrically connecting all parts to a common ground conductor. Grounding exterior parts of containers alone does not necessarily eliminate all of the danger from static electricity for in order to be completely effective, grounding must include the contents, which is not always practicable. Partial grounding or using conductors of insufficient strength or too high resistance may increase the static hazard by providing other opportunities for discharge through an uncontrolled path to ground. Permanent equipment in contact with conductive floors or table tops is not considered to be adequately grounded. Static grounds shall not be made to gas, steam or air lines, dry pipe sprinkler systems or air terminals of lightning protection systems. Static grounds can be made to water pipes, ground cones, buried copper plates or driven ground rods, which may or may not be part of the lightning protection system or to down conductors of lightning protection systems. All conductive parts of equipment shall be grounded so that resistance does not exceed 25 ohms, unless 10 ohms is required for lightning protection.

22. Spray Painting.

a. Water wash or dry filter type spray booths exclusively shall be used for loaded ammunition and should be used for inert items. Filters for dry type booths must not support combustion when clean and must be capable of effectively arresting paint overspray. They must be replaced whenever the type of paint being sprayed is changed. Paint-encrusted filters shall be disposed of promptly.

b. Automatic sprinklers shall be installed above and 20 feet horizontally beyond the perimeter of the booth, if the building in which the spray booth is located is not provided with sprinkler protection. In addition, automatic sprinkler protection shall be installed in exhaust ducts 6 feet or more in length and the sprinkler heads shall be located not more than 12 feet apart in those ducts that pass through combustible walls, ceiling or roof structures.

c. Controls for paint spray booth ventilating fan motors shall be interlocked with the controls for the paint sprayer. With this arrangement, failure of the ventilating system will shut off power to the paint sprayer.

d. When a requirement does exist to set up field operations and the requirements of paragraph a above cannot be met, spray painting of sizeable quantities of loaded ammunition or inert items is permissible if:

(1) Paint booths are constructed of noncombustible material.

(2) An exhaust system with exhaust fan is installed to remove paint fumes from the booth.

(3) At least two CO_2 or foam type extinguishers are installed within the booth with rate of rise actuated nozzle attachments. Two manual type CO_2 or foam type portable fire extinguishers must also be provided at the paint spray booth or operation.

(4) Special precautions are taken to keep the booth clean and prevent the accumulation of paint on the surface of the booth or fire extinguisher nozzles.

(5) The number of items in the booth at any one time are restricted to the minimum number required for efficient and continuous operation.

(6) The area within 50 feet of the paint booth is kept free of combustible material, such as dry vegetation, wooden pallets, combustible crating or packing materials.

(7) Paint and chemical mixing operations, supplies and air compressors are located at least 50 feet from the infrared drying equipment.

e. If the quantity of loaded ammunition or inert items to be spray painted in an outside location does not warrant the provision of a paint booth, the operation may be performed in the open provided:

(1) The area within 50 feet of the spray paint operation is kept clean and free from extraneous combustible material, air compressors and paint mixing operations.

(2) At least two portable fire extinguishers are provided at the spray painting operation.

(3) Personnel are protected from toxic materials by means of respirators.

(4) Personnel limits are maintained at the minimum required for efficient safe operation.

23. Drying Freshly Painted Loaded Ammunition.

a. Ovens in which freshly painted loaded ammunition is dried shall be automatic thermostatic controlled. The controls shall be arranged to stop the application of heat upon reaching a predetermined maximum temperature which should not exceed 170° F.

b. The oven shall be equipped with an automatic sprinkler system.

c. Heating may be by hot air or other means as long as ammunition does not come in contact with the heating elements.

d. If a conveyor system is employed, provision will be made to shut off the heat supply automatically in the event of power failure to the conveyor.

24. Infrared Ray Drying.

a. Infrared drying process should not be used in the same room in which exposed explosives are present.

b. If sealed items containing explosives are to be subjected to infrared drying processes, prior tests to determine maximum internal temperatures to which explosives will be raised by such rays shall be conducted on duplicate sealed containers with inert filler having a thermal conductivity and specific heat similar to that of the explosives.

c. Before freshly dipped or painted items are processed in infrared drying equipment, they shall pass through a predryer. This predryer shall be provided with positive mechanical ventilation, constructed of noncombustible materials and shall be provided with automatic sprinkler protection. The predryer need not be heated. Freshly dipped or painted articles shall be predried until at least 85 percent of the volatile flammable vapors are removed. (In most instances, less than two minutes are required when air velocity past the article in the predryer is 300 feet per minute and the circulated air temperature is 70° F.

d. Infrared drying equipment shall be installed in a large open room at least six times as large in unobstructed area as the area of the booth.

e. Adequate ventilation shall be provided for the room to keep vapor air mixture at least 25 percent below the lower explosive limit, and also below the threshold limit valves, as a health hazard.

f. The construction of infrared drying equipment shall be such that paint dripping from articles will not strike the lamps, reflectors or wiring. The construction and position of the infrared drying equipment and conveyor equipment shall be such that contact between articles and bulbs is not possible.

25. Housekeeping.

Covered, fire resistant rubbish cans should be provided. Metal waste cans, appropriately painted and marked, and with self-closing covers shall be conveniently located for the disposal of oily rags and waste. Accumulations of odds and ends or waste meterial in out-of-way places should be avoided. Cupboards, closets, and spaces under benches, conveyors, stairs and platforms shall be inspected weekly or more frequently if required to assure cleanliness. Volatile flammable liquids shall not be permitted to remain in open containers nor shall they be used except where specifically authorized as process requirements. Where use of such liquids is authorized, working quantities shall be identified and confined to appropriately painted approved safety containers.

26. Deluge Systems.

In addition to sprinklers, deluge systems should be provided for the protection of operating personnel in high hazard occupancies. The distributing outlets (nozzles, sprays, heads, etc.) should be located as close to the exposed surface of the explosive as possible, consistent with the outlet discharge pattern, to insure immediate drenching of all parts of the machine under extreme conditions. When explosives are located inside of machine, under tight hoods or cover, distributing outlets should be located inside the enclosed space. The deluge valve shall be arranged for automatic and/or manual actuation.

27. Assembly and Crimping of Complete Rounds.

Each assembly and crimping machine shall be separated from other similar or dissimilar operations by walls or operational shields that are sufficiently strong to retain any fragement that may be produced.

28. Storage in Operating Buildings.

Hazardous materials, including explosive materials, shall not be stored within an operating building except for the minimum quantities necessary to maintain individual operations. Supplies exceeding approximately a four-hour work requirement shall be kept in a service storage building. In the case of explosive materials, the service storage building (service magazines) shall be located at appropriate intraline distance from the operating building, based on the quantity of explosives in the service storage building.

29. Demilitarizing of Fuzes and Other Loaded Components.

Fuzes, primers, boosters and other items containing explosives should be disassembled into their separate components for destruction, to assure elimination of the contamination hazard and provide ready means of inspection after burning or detonation. Where the methods used for demilitarization are such that the residue can be certified as being free of explosives contamination, disassembly prior to burning or detonation is not required.

APPENDIX D

DISPOSAL INSTRUCTIONS

1. General.

This appendix prescribes the various methods of disposal of explosive items to be utilized in preparing local standing operating procedures (SOP's) in conjunction with local safety requirements. TM 9-1300-206 and/or AMCR 385-100 will take precedence in the event of a conflict with this appendix.

2. Disposal by Burning in Deactivation Furnace.

a. Description of Operation:

(1) Start deactivation furnace, APE 1009 M4 or APE 1236 in accordance with the applicable operational manual.

(2) Adjust furnace in accordance with operational manual.

(3) Place explosive items on charge conveyor in steady predetermined amount.

NOTE: Avoid intermittent, heavy or pile loading. Production rate cited in operational manual may be used as a guide. The explosive limit of an individual item is 600 grains of explosives.

b. Inspection and Safety Requirements (Special).

(1) Clear all personnel from area inclosed by barricaded walls when proper operating temperature is obtained in the retort of furnace.

(2) Do not allow conveyors to stand idle while furnace is heating.

(3) Inspect residual metal components and certify for adequacy of decontamination in accordance with paragraph 13 of safety appendix.

(4) The restriction to 600 grains does not mean that total explosives permitted in the furnace retort at one time is limited to 600 grains. The rate of feed, retort RPM and temperature should be controlled so that spiral leads separate items to prevent sympathetic detonations at any point in excess of 600 grains of explosives.

c. Disposition of Components and Material.

(1) Residual metal to PDO.

(2) Packing material to PDO, unless otherwise specified.

d. Equipment Required.

(1) Furnace, Deactivation, Small items APE 1009 M4, FSN 4925-944-5353 or Furnace, Deactivation, Heavy duty, APE 1236, FSN 4925-477-6262.

(2) Approved containers.

3. Disposal by Burning (Alternate Method).

a. Description of Operation.

(1) Prepare a pit approximately six feet square and four feet deep.

(2) Install an inclined chute at an angle that will permit the explosive items to slide down.

NOTE: Chute should be positioned so that one end is over the center of the pit and the other end behind a barricade. Chute should be provided with a baffle so operator cannot look through the chute.

(3) Build a hot fire in the pit utilizing scrap lumber, wood or such material as excelsior.

(4) Feed the explosive items into the chute.

b. Inspection and Safety Requirements (Special).

(1) Assure a baffle is provided on the chute to prevent operator from looking through the chute.

(2) Assure the pit is covered with sheet iron or other suitable material to confine flying fragments.

(3) Stocks of explosive items will not be placed within 300 feet of the burning operation.

(4) Inspect residual metal components and certify for adequacy of decontamination in accordance with paragraph 13 of safety appendix.

(5) Material awaiting destruction shall be protected against accidental ignition or explosion from fragments, grass fires, burning embers or detonating impulse originating in materials being destroyed.

(6) During disposal and destruction operations, the number of people in the area exposed to the hazard must be kept to a minimum. Warning signs or road blocks shall be posted to restrict the area and to insure proper segregation of activities. The number of personnel engaged in

the disposal and destruction operations shall be no fewer than two and operations shall be arranged so that not all of the personnel are exposed to an incident.

(7) Personnel engaged in burning explosives should be provided with flameproof type clothing in accordance with paragraph 5 of safety appendix.

c. Equipment Required.

(1) Chute such as a piece of two inch pipe.

(2) Approved containers.

(3) Sheet iron or other suitable material.

4. Disposal by Burning (Alternate Method).

a. Description of Operation.

(1) Prepare a trench approximately two feet deep, one foot wide and of sufficient length to accommodate the items to be burned at one time.

NOTE: A burning cage may be used in lieu of a trench.

(2) Prepare the trench or burning cage with a sufficient quantity of excelsior or similar combustible material to insure a hot fire throughout the length of the trench or cage.

(3) Place explosive items on the excelsior prior to lighting the fire.

(4) Cover trench with a piece of sheet metal to confine fragments.

(5) Prepare a train of combustible material leading into the pit or cage.

NOTE: Arrange the train so both it and the explosives burn in the direction from which the wind is blowing.

(6) Receive and unpack safety fuse (fuse blasting time) from storage. FSN 1375-M670.

NOTE: Explosive items must be loaded and blocked in an approved carrier for transfer to burning area. Black powder squib, initiated electrically may be used in lieu of safety fuse.

(7) Cut safety fuse squarely across and discard two or three inches from the end of the coil.

(8) Cut off and test a one foot length from each roll of time safety fuse for determination of burning time.

NOTE: Safety fuse must be tested for burning rate at the beginning of each day's operation and whenever a new coil is used. Burning rate may vary 30 seconds or less per foot to 45 seconds or more per foot.

(9) Cut a sufficient length of safety fuse to permit personnel to walk, not run, to a place of safety before lead train ignites.

NOTE: Safety fuse must not be used that is less than 3 feet long or burns through in less than 120 seconds.

(10) Receive and unpack igniter, time blasting fuse, FSN 1375-M765 or 1375-M766.

(11) Place igniter time blasting fuse on one end of the safety fuse.

(12) Insert the free end of the safety fuse into the combustible train.

NOTE: Assure a readily combustible material is used to ignite the train, i.e., propellant, black powder, oil soaked material, etc.

(13) Ignite the safety fuse.

(14) Personnel should take cover or withdraw to a safe distance.

b. Inspection and Safety Requirements (Special).

(1) Burning will not be repeated in previously burned trenches or cages within 24 hours unless the burning area has been thoroughly soaked with water and an inspection is made of the trench or cage to assure the safety of personnel during a subsequent burning operation.

(2) Scrap material will be certified as free of all explosive contamination prior to transfer to salvage in accordance with paragraph 13 of safety appendix.

(3) Items awaiting destruction shall not be stored within 30 feet from the burning operation.

(4) During disposal and destruction operations, the number of people in the area exposed to the hazard must be kept to a minimum. Warning signs or road blocks shall be posted to restrict the area and to insure proper segregation of activities. The number of personnel engaged in the disposal and destruction operations shall be no fewer than two, and operations shall be arranged so that not all of the personnel are exposed to an accident.

(5) Personnel engaged in burning explosives should be provided with flameproof type clothing in accordance with paragraph 5 of safety appendix.

(6) When burning explosives, the possibility that the mass may detonate must be recognized with regard to barriers and distance separation.

c. Disposition of Components and Material.

Residual metal - to PDO.

d. Equipment Required.

(1) Safety fuse FSN 1375-M670.

(2) Igniter, time blasting fuse FSN 1375-M765 or 1375-M766.

(3) Approved containers.

5. Disposal by Electrical Detonation.

a. Description of Operation.

(1) Prepare a trench or pit approximately four feet deep.

NOTE: Where space permits and the demolition area is located in a remote area, detonation may be accomplished without the aid of a pit or trench.

(2) Explosive items must be loaded and blocked in an approved carrier for transfer to demolition area.

(3) Place explosive items or projectiles in trench, pit or location for detonation. Explosive items should be in contact with one another in an open container. Projectiles will be placed on their sides.

NOTE: The quantity of material to be destroyed at one time will depend upon local conditions.

(4) Receive and unpack demolition blocks or initiating explosives from storage.

(5) Place an adequate number of demolition blocks or initiating explosives on top of each container or projectile and in contact with the explosive items.

NOTE: Demolition blocks may be held in position by earth packed over the blocks. Allow for insertion of the blasting cap.

(6) Check blasting circuit with a good quality No. 47 radio pilot lamp or voltohm-meter for stray current.

NOTE: The electric blasting cap will not be used if the lamp glows or there is evidence of stray current on the voltohm-meter. Operation should cease until the stray current is removed or utilize non-electric blasting cap and safety fuze.

(7) Receive electric blasting caps from storage. Assure the lead wires are properly shunted by safety clips or twisted together.

NOTE: Blasting caps will not be transported with any other explosives.

(8) Unpack blasting caps and unroll lead wires.

NOTE: During uncoiling the leads, the cap should not be held directly in the hand. Leads will not be thrown, waved through the air, or snapped to unloosen the lead wires.

(9) Electric blasting cap may be tested with a galvanometer or blasting cap test set prior to priming the charge. The lead wires must be shortcircuited by twisting the bare ends of the wire immediately after testing.

(10) Remove shunt from blasting cap lead wires or untwist the lead wires and connect to the blasting circuit wires. Tape the connections.

(11) Insert the blasting cap in the demolition blocks or initiating explosives.

NOTE: Blasting caps should not be buried beneath the ground level with the initiating charge.

(12) Test firing circuit for electrical continuity with galvanometer or test set prior to making connections to blasting machine or electrical source.

(13) Connect firing circuit to blasting machine or electrical source and detonate the explosive items.

NOTE: Assure all personnel have been evacuated to a safe location prior to making connections and detonations.

(14) Alternate priming method - Receive primacord (detonating cord) from storage.

NOTE: When items to be detonated are covered with earth, the initiating explosives should be primed with primacord.

(15) Cut a sufficient length of primacord to reach up through earth covering.

(16) Wrap the primacord around the demolition block or insert in plastic initiating explosive. (See Figure 1).

(17) Place demolition blocks on initiating explosive on top of each container or projectile and in contact with the explosive items.

(18) Cover explosive items with not less than two feet of earth.

(19) Remove shunt from blasting cap lead wires and connect to the blasting circuit wires. Tape the connections.

(20) Attach blasting cap to the free end of the primacord by means of a length of string, wire or friction tape.

(21) Test firing circuit for electrical continuity with a galvanometer prior to making connections to blasting machine or electrical source.

(22) Connect firing circuit to blasting machine or electrical source and detonate the explosive items by means of blasting machine or electrical source.

b. Inspection and Safety Requirements (Special).

(1) In case of misfires, personnel shall not return to the point of detonation for at least 30 minutes.

(2) Search the surrounding area for unexploded materials and items after each detonation.

(3) The firing wires at the power source shall be twisted or shorted and connected to ground, except when actually firing the charge or testing the circuit.

(4) The number of blasting caps should be kept to a minimum.

(5) During disposal and destruction operations, the number of people in the area exposed to the hazard must be kept to a minimum. Warning signs or road blocks shall be posted to restrict the area and to insure proper segregation of activities. The number of personnel engaged in the disposal and destruction operations shall be no fewer than two and operations shall be arranged so that not all of the personnel are exposed to an accident.

c. Disposition of Components and Material.

Packing material to PDO or local use unless otherwise specified.

d. Equipment Required.

(1) Firing wire.

(2) Blasting Machine 10 cap, FSN 1375-212-4614, or 30 cap FSN 1375-092-9017, 50 cap FSN 1375-141-9495.

(3) Galvanometer FSN 6625-212-4605 or test set blasting cap M51, FSN 6625-999-3454.

(4) Blasting Caps FSN 1375-M130.

(5) Demolition blocks or initiating explosives.

(6) Primacord as applicable FSN 1375-M455.

(7) Crimper, Cap with fuse cutter FSN 1375-212-4604.

(8) Approved hand tools and containers.

6. Disposal by Non-Electric Detonation.

a. Description of Operation.

(1) Prepare a trench or pit approximately four feet deep.

NOTE: Where space permits and the demolition area is located in a remote area, detonation may be accomplished without the aid of a pit or trench.

(2) Place explosive items or projectiles in trench, pit or location for detonation. Explosive items should be in contact with one another in an open container. Projectiles will be placed on their sides or in the position to expose the largest area.

NOTE: Explosive items and projectiles must be loaded and blocked in an approved carrier for transfer to demolition area.

(3) Receive and unpack demolition blocks or initiating explosives from storage.

(4) Place an adequate number of demolition blocks or initiating explosives on top of each container or projectile and in contact with the explosive items.

NOTE: Demolition blocks may be held in position by earth packed over the blocks. Allow for insertion of the blasting cap.

(5) Receive and unpack time blasting fuse (safety fuse) from storage.

(6) Cut fuse squarely across and discard two or three inches from the end of the coil.

(7) Cut off and test a one foot length from each roll of time blasting fuse for determination of burning time.

NOTE: Time blasting must be tested for burning rate at the beginning of each day's operation and whenever a new coil is used. Burning rate may vary 30 seconds or less per foot to 45 seconds or more per foot.

(8) Cut a sufficient length of time blasting fuse to permit personnel to walk, not run, to a place of safety before charge detonates.

NOTE: Safety fuse must not be used that is less than 3 feet long or burns through in less than 120 seconds.

(9) Receive non-electric blasting caps from storage.

NOTE: Blasting caps will not be transported with any other explosives.

(10) Place non-electric blasting cap over the time fuse and crimp.

NOTE: Do not turn or twist fuse in the cap. Standard type cap crimper must be used.

(11) Place igniter time blasting fuse on the free end of the time fuse.

(12) Insert non-electric blasting cap in demolition charge or initiating explosives.

NOTE: Blasting caps should not be buried beneath the ground level with the initiating charge.

(13) Ignite the safety fuse.

NOTE: Assure all personnel have been evacuated to a safe location.

(14) Alternate Priming Method:

Receive primacord from storage.

NOTE: When items to be detonated are covered with earth, the initiating explosives should be primed with primacord.

(15) Cut a sufficient length of primacord to reach up through earth covering.

(16) Wrap the primacord around the demolition blocks or insert in initiating explosive. (See Figure 1.)

(17) Place demolition blocks or initiating explosives on top of each container or projectile and in contact with the item.

NOTE: Projectiles will be placed in their sides or in the position to expose the largest area.

(18) Cover explosive items with not less than two feet of earth.

(19) Follow steps 5, 6, 7, 8, 9, 10 and 11.

(20) Attach blasting cap to the free end of the primacord by means of a length of string, wire or friction tape.

(21) Ignite the safety fuse.

NOTE: Assure all personnel have been evacuated to a safe location.

b. Inspection and Safety Requirements (Special).

(1) In case of misfires, personnel shall not return to the point of detonation for at least 30 minutes.

(2) Search the surrounding area for unexploded material and items after each detonation.

(3) The number of blasting caps should be kept to a minimum.

(4) During disposal and destruction operations, the number of people in the area exposed to the hazard must be kept to a minimum. Warning signs or road blocks shall be posted to restrict the area and to insure proper segregation of activities. The number of personnel engaged in the disposal and destruction operations shall be no fewer than two and operations shall be arranged so that not all of the personnel are exposed to an accident.

c. Disposition of Components and Material.

Packing material to PDO unless otherwise specified or for local use.

d. Equipment Required.

(1) Non-electric blasting caps - FSN 1375-M131.

(2) Primacord as applicable - FSN 1375-M455.

(3) Safety fuse - FSN 1375-M765 or FSN 1375-M766.

(4) Igniter, time blasting fuse, FSN 1375-M765 or 1375-M766.

(5) Demolition blocks or initiating explosives.

(6) Crimper, cap with fuse cutter, FSN 1375-212-4604.

(7) Tape.

(8) Approved hand tools.

7. Burning out Loaded HE Projectiles.

a. Description of Operation.

(1) TNT, Explosive D, Composition B, penolite, and other explosive filler in open projectiles may be burned out when destruction by detonation or washing out and burning the explosive filler separately is impracticable.

(2) Place projectiles on their sides and arrange in groups of not more than six projectiles.

NOTE: The open ends will be facing in one direction and should not be pointed into the wind. Each group of projectiles should be separated at least 12 inches apart.

(3) Prepare a train of combustible material, i.e., excelsior, scrap lumber or oil-soaked waste, leading to the open ends of the projectiles.

NOTE: Waste shall not be placed in the interior of the fuze cavities. Class 2 solid propellant may be used for ignition of the projectile filler.

NOTE: Arrange the train so it will burn in the direction from which the wind is blowing.

(4) Receive and unpack safety fuse (fuse blasting time) from storage.

NOTE: Explosive items must be loaded and blocked in an approved carrier for transfer to burning area. Black powder squib, initiated electrically, may be used in lieu of safety fuse.

(5) Cut safety fuse squarely across and discard two or three inches from the end of the coil.

(6) Cut off and test a one-foot length from each roll of time safety fuse for determination of burning time.

NOTE: Safety fuse must be tested for burning rate at the beginning of each day's operation and whenever a new coil is used. Burning rate may vary 30 seconds or less per foot to 45 seconds or more per foot.

(7) Cut a sufficient length of safety fuse to permit personnel to walk, not run, to a place of safety before lead train ignites.

NOTE: Safety fuse must not be used that is less than 3 feet long or burns through in less than 120 seconds.

(8) Receive and unpack igniter time blasting fuse from storage.

(9) Place igniter time blasting fuse on one end of the safety fuse.

(10) Insert the free end of the safety fuse into the combustible train.

NOTE: Assure a readily combustible material is used to ignite the train, i.e., propellant, black powder, oil-soaked material, etc.

(11) Ignite the safety fuse.

(12) Personnel should take cover or withdraw to a safe distance.

b. Inspection and Safety Requirements.

(1) Burned out projectiles shall be reprocessed to assure that explosive residue does not remain. The projectile shall be thoroughly inspected in accordance with paragraph 13 of safety appendix.

(2) Items awaiting destruction shall be stored not less than 300 feet from the burning operation.

(3) When burning explosives, the possibility that mass may detonate must be recognized with regard to barriers and distance separation.

c. Disposition of Components and Material.

Residual projectiles to PDO.

d. Equipment Required.

(1) Safety fuse - FSN 1375-M670.

(2) Igniter, time blasting fuse - FSN 1375-M765 or 1375-M766.

(3) Approved containers.

8. Burning Propellants.

a. Description of Operation.

(1) Receive propelling charges and/or loose propellant from the demilitarization operation.

(2) Place loose, dry propellant on the ground in parallel beds not more than three inches deep. Beds shall be separated by not less than 150 feet.

NOTE: Wet propellant may require a thick bed of readily combustible material such as excelsior underneath and beyond to assure that all the propellant will be consumed once the materials are ignited.

(3) Prepare propelling charges by positioning charges in a single layer laid side by side.

NOTE: Propelling charges with igniters may be burned without slitting but in all cases igniter protector caps shall be removed from the charges to be burned. Core igniter type charges in the single layer should be separated one from the other by a distance equal to one caliber.

(4) Prepare a train of combustible material, i.e., excelsior, scrap lumber or oil-soaked waste, leading the the propellant or propelling charges.

NOTE: The propellant may be ignited directly without the combustible material. Arrange the train so it and the propellant burn inthe direction from which the wind is blowing.

(5) Receive and unpack safety fuse (fuse blasting time) from storage.

NOTE: Explosive items must be loaded and blocked in an approved carrier for transfer to burning area. Black powder squib, initiated electrically, may be used in lieu of safety fuse. It may be necessary to tie two or

more squibs together to assure ignition of combustible train.

(6) Cut safety fuse squarely across and discard two or three inches from the end of the coil.

(7) Cut off and test a one-foot length from each roll of time safety fuse for determination of burning time.

NOTE: Safety fuse must be tested for burning rate at the beginning of each day's operation and whenever a new coil is used. Burning rate may vary 30 seconds or less per foot to 45 seconds or more per foot.

(8) Cut a sufficient length of safety fuse to permit personnel to walk, not run, to a place of safety before lead train ignites.

NOTE: Safety fuse must not be used that is less than 3 feet long or burns through in less than 120 seconds.

(9) Receive and unpack igniter time blasting fuse from storage.

(10) Place igniter time blasting fuse on one end of the safety fuse.

(11) Insert the free end of the safety fuse into the combustible train or propellant.

(12) Ignite the safety fuse.

(13) Personnel should take cover or withdraw to a safe distance.

b. Inspection and Safety Requirements (Special).

(1) Quantity to be burned at one time should be determined by trial and will be kept within the maximum limit specified in approved SOP prepared by the activity performing the demilitarization.

(2) Burnings shall not be repeated on previously burned-over plots within 24 hours unless the burning area has been thoroughly soaked with water.

(3) When misfires occur, personnel shall not return to the point of initiation for at least 30 minutes. Not more than two qualified persons shall be permitted to examine the misfire.

c. Disposition of Components and Material.

(1) Serviceable containers return to storage unless otherwise directed.

(2) Unserviceable containers to property disposal.

d. Equipment Required.

(1) Safety fuse - FSN 1375-M670

(2) Igniter, Time blasting fuse - FSN 1375-M765 or 1375-M766.

(3) Approved containers.

(4) Fuse cutter, FSN 1375-212-4604.

9. Burning WP/PWP Projectiles:

a. Description of Operation.

(1) WP/PWP filled projectiles without bursters may be destroyed by burning.

(2) Place a considerable amount of combustible material, i.e., excelsior, scrap lumber etc., in the bottom of a pit.

(3) Place projectiles on their sides on the combustible material with the open ends in the same direction.

NOTE: A hot fire is necessary to force burster casing from the projectile, thus allowing the WP filler to escape and burn. Volume of smoke is a controlling factor in the quantity to be burned at one time. Special precautions must be taken to avoid obscurring traveled highways or other places where the presence of a smoke screen could result in injury to personnel or equipment. Temperature of the item being decontaminated by flashing should be raised to a temperature equal to or above the detonation point of the explosive with which the item has been contaminated.

(4) Ignite by means of a train of combustible material prepared in accordance with paragraph 7 of this Appendix.

b. Inspection and Safety Requirements:

(1) The projectile shall be thoroughly inspected in accordance with paragraph 13 of safety appendix. Projectiles which are not completely decontaminated should be reprocessed.

(2) Items awaiting destruction shall not be stored less than 300 feet from the burning operation.

c. Disposition of Components and Material:

Residual projectiles to PDO or debanding operation.

d. Equipment Required:

(1) Safety fuse - FSN 1375-M670.

(2) Igniter, time blasting fuse - FSN 1375-M765 or 1375-M766.

(3) Approved containers.

10. Disposal of WP/PWP Projectiles by Detonation:

a. Description of Operation:

(1) WP/PWP filled projectiles may be destroyed by detonation.

(2) Prepare and detonate projectiles in accordance with paragraph 5 or 6 of this Appendix.

NOTE: When destroying munitions loaded with white phosphorus or plasticized white phosphorus, use a larger than-normal explosive charge to rupture the case completely and disperse the WP so that it can burn out.

b. Inspection and Safety Requirements (Special).

The provisions of paragraph 5b or 6b this Appendix applies.

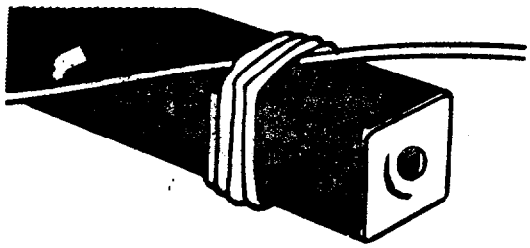
c. Disposition of Components and Material.

The provisions of paragraph 5c or 6b this Appendix applies.

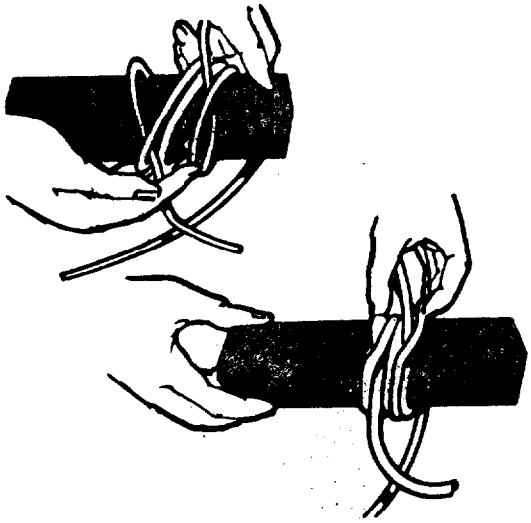
d. Equipment Required.

The provisions of paragraph 5d or 6d this Appendix applies.

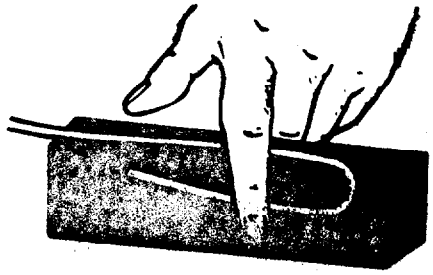
A. COMMON METHOD

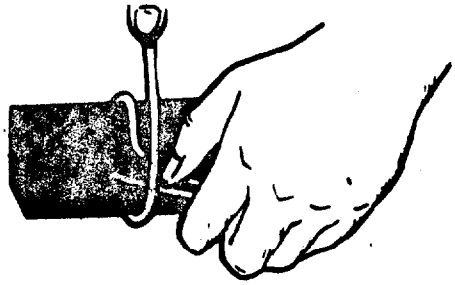


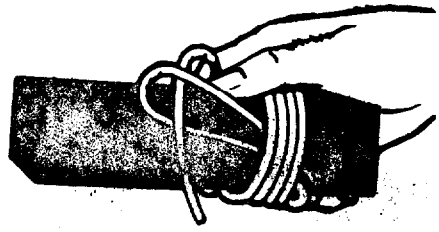
B. ALTERNATE NO. 1



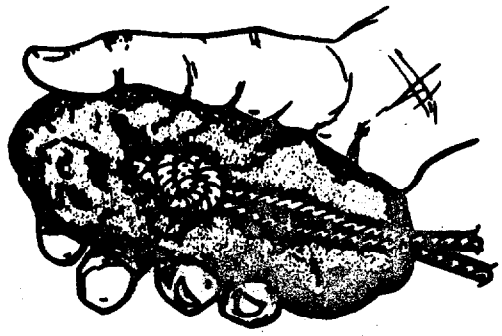
C. ALTERNATE NO. 2

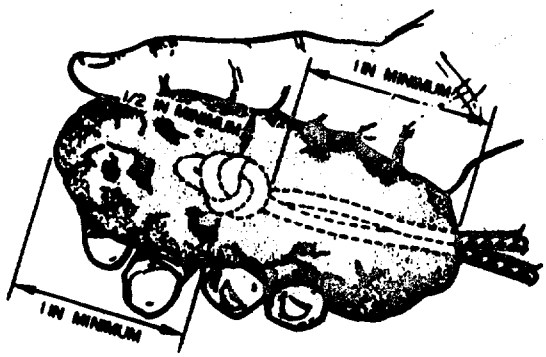






DETONATING CORD PRIMING OF DEMOLITION BLOCKS





DETONATING CORD PRIMING OF
PLASTIC EXPLOSIVE

Figure 1

(DRSAR-MAS)

FOR THE COMMANDER:

JOHN C. SCHOLZ
COL, GS
Chief of Staff

OFFICIAL:

Donald P. Kelly

DONALD P. KELLY
COL, GS
Director of Maintenance

DISTRIBUTION:
SPECIAL

Encl 1

2-13

DISTRIBUTION	NO. OF COPIES
Commander	
US Army Armament Materiel Readiness Command	
ATTN: DRSAR-QAS	2
DRSAR-SF	1
DRSAR-MAS	2
DRSAR-MAD	4
MCLNO-LMA	1
DRSAR-MAP-R	2
DRSAR-LES	1
DRSAR-DA	1
DRSAR-DAS	1
Rock Island, IL 61299	
Commander	
USA DARCOM Materiel Readiness Support Activity	
ATTN: DRXMD-EP	2
DRXMD-MP	1
Lexington, KY 40511	
Commander	
DARCOM Surety Field Activity	
ATTN: DRCSA-NF	1
Dover, NJ 07801	
Director	
US Army Materiel Development and Readiness Command Field Safety Activity	
ATTN: DRXOS-ES	2
Charlestown, IN 47111	
Director	
DA Defense Ammunition Center & School	
ATTN: SARAC-DEN	2
SARAC-ASA	3
SARAC-AV	2
Savanna, IL 61074	
Project Manager for Selected Ammunition	
US Army Materiel Development and Readiness Command	
ATTN: DRCPM-SA-LM	1
Dover, NJ 07801	

NO. OF COPIES

Commander
US Army Materiel Development and Readiness Command
ATTN: DRCRE-ID 1
DRCMM-MS 1
5001 Eisenhower Blvd
Alexandria, VA 22333

Commandant
US Army Missile & Munitions Center & School
ATTN: ATSK-CD-CS 2
ATSK-CD-MD 1
ATSK-DT-MU-CA 1
Redstone Arsenal, AL 35809

Commander
US Army Ordnance Center & School
ATTN: ATSL-CTD-MS 1
AHDA-D 1
Aberdeen Proving Ground, MD 21005

Commander
US Army Training & Doctrine Command
ATTN: ATCD-CM 1
Fort Monroe, VA 23351

Commander
Anniston Army Depot
ATTN: SDSAN-DSP-PPC 5
Anniston, AL 36201

Commander
Letterkenny Army Depot
ATTN: SDSLE-TA 4
Chambersburg, PA 17201

Commander
Lexington-Blue Grass Army Depot
Blue Grass Activity
ATTN: SDSRR-LSA 5
Lexington, KY 40511

Commander
Pueblo Army Depot Activity
ATTN: SDSTE-PUS-A 5
Pueblo, CO 81001

	NO. OF COPIES
Commander Red River Army Depot ATTN: SDSRR-SP Texarkana, TX 75501	5
Commander Savanna Army Depot Activity ATTN: SDSLE-VM SDSLE-VS Savanna, IL 61074	2 2
Commander Seneca Army Depot ATTN: SDSSE-OP Romulus, NY 14541	5
Commander Tooele Army Depot ATTN: DRXTE-AEO DRXTE-DSP DRXTE-QAV DRXTE-QAA (Tech Library) Tooele, UT 84074	1 5 1 1
Commander Umatilla Army Depot Activity ATTN: DRXTE-UAM Hermiston, OR 97838	5
Commander Fort Wingate Army Depot Activity ATTN: DRXTE-FWM Gallup, NM 87301	2
Commander Navajo Army Depot Activity ATTN: DRXTE-NAM Flagstaff, AZ 86001	2
Commander US Army Armament Materiel Readiness Command ATTN: DRSAR-MAS-C Aberdeen Proving Ground, MD 21010	1

	NO. OF COPIES
Commander US Army Armament Materiel Readiness Command ATTN: DRSAR-MAD-C DRSAR-MAD-I DRSAR-MAF-PV Dover, NJ 07801	 4 5 2
Commander Pine Bluff Arsenal ATTN: SARPB-DP Pine Bluff, AR 71601	 2
Commander Yuma Proving Grounds ATTN: STEYP-SAF-Q Yuma, AZ 85364	 2
Commander 60th Ordnance Group ATTN: AEROD-MS APO New York 09052	 10
Commander Caerwent Army Depot Activity ATTN: AERUK-H-SU APO New York 09150	 2
Commander 193 Infantry Brigade (CZ) APO New York 09827	 3
Commander US Army Central Ammunition Management Office (Pacific) ATTN: SARCA-DPM Ft. Shafter, HI 96858	 1
Commander US Army Armament Research and Development Command ATTN: DRDAR-LMC Dover, NJ 07801	 2
Commander US Army Japan ATTN: AJGD-SA APO San Francisco 96343	 1

	NO. OF COPIES
Commander 19th Support Command ATTN: EANC-GA-AM APO San Francisco 96212	10
Commander Eight US Army ATTN: DJ-AM-M APO San Francisco 96301	2
Commander USA Ammo Complex — AKIZUKI ATTN: GARH-AM-AS FPO Seattle, WA 98764	6
Commandant of the Marine Corps Headquarters, U.S. Marine Corps ATTN: Code LMG Code LMW Washington, DC 20380	 2 1
Commander 172nd Infantry Brigade (AK) ATTN: AFZT-DI-CWA Fort Richardson, AK 99505	3
Commander 267th Chemical Co. ATTN: AFZV-PF-CH APO San Francisco 96305	2
Commanding General MCDEC Fire Power Div (GRD OPS) Quantico, VA 22134	1
Commander Hawthorne Army Ammunition Plant ATTN: SARHW-ASA, (Ms. Reynolds) Hawthorne, NV 89415	5

	NO. OF COPIES
Commander McAlester Army Ammunition Plant ATTN: SARMC-PSM McAlester, OK 74501	5
Commander Crane Army Ammunition Activity ATTN: SARCN-AO Crane, IN 47522	4
Commander US Army Support Command, Hawaii ATTN: AFZV-DI-MU Fort Shafter, HI 96858	1
Commander Sierra Army Depot ATTN: SDSSI-PPC SDSSI-CA Herlong, CA 96113	3 2
US Army Berlin Maintenance Division APO New York 09742	1
Commander Naval Sea System Command Naval Ammunition Production Engineering Center ATTN: SEA-04J2511 Naval Support Center Crane, IN 47522	1
Commander US Army Depot System Command ATTN: DRSDS-GM Chambersburg, PA 17201	1
Director US Army Materiel Systems Analysis Activity ATTN: DRXSY-RW (Mr. Heatwole) Aberdeen Proving Ground, MD 21005	1

	NO. OF COPIES
Commander Fleet Activities Code: 840 FPO Seattle 98762	2
Commanding Officer US Naval Magazine Code: QA FPO San Francisco 96630	3
Commanding Officer US Naval Magazine Box 68 Code 43 FPO San Francisco 96651	4
Commanding Officer US Naval Ordnance Facility Box 28 QA Tech Library FPO Seattle 98766	2
Commanding Officer Naval Ordnance Station Code: 052 Indian Head, Maryland 20640	2
Commanding Officer Naval Undersea Warfare Engineering Station Code: 0523 Keyport, Washington 98345	4
Commanding Officer Naval Weapons Station Code: 013-B Charleston, South Carolina 29408	3
Commanding Officer Naval Weapons Station Earle Code: 052 Colts Neck, New Jersey 07722	2

	NO. OF COPIES
Commanding Officer Naval Weapons Station Code: 052 Seal Beach, California 90740	3
Commanding Officer Naval Weapons Station Code: 2034 Yorktown, Virginia 23691	5
Commander Naval Sea Systems Command NAVAMPROENGCEN Naval Weapons Support Center	
Code: SEA-06J25A2	1
SEA-06J2511	1
SEA-06J2513	1
SEA-06J2533 Crane, Indiana 47522	1
Commanding Officer Naval Weapons Station Code: 20100 Concord, California 94520	8